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EDUCATION

Vol. 60 MAY, 1940 No. 9

EDITOR'S FOREWORD

THERE is great interest at the present moment in industrial education both on the part of educational leaders and of the general public. This unusual interest is due in part to a growing realization of the significance of industry in social and economic life, in part to a better understanding of the educative values of the experiences provided in well-planned courses in shop work and mechanical drawing, and in large part to the changing character of the school population resulting from the decreasing demand for juvenile labor. It is clear that the schools must provide, increasingly, experiences in industrial processes and must impart knowledge of industrial materials, products, and problems if youth is to be prepared adequately to deal with modern life.

Industrial Education includes two fairly distinct areas, namely, (1) industrial arts, or non-vocational courses, using the tools, processes and facts of industry and (2) trade education, or vocational-industrial education, which is definitely vocational in purpose. The distinction between the characteristics and purposes of these two areas is well understood within the field of industrial education, but is not so clearly appreciated by those in other fields of education.

This number of EDUCATION is concerned only with industrial-arts or the non-vocational phase of industrial education. It should, therefore, be of interest to all teachers of courses in general education.

All the contributors are well-known men in the field of industrial education and have written out of rich and successful experience. It will be found that this number of EDUCATION presents an unusually comprehensive view of the various aspects of industrial arts instruction. Authoritative answers to many vexing problems in this area of modern school work will be found in this collection of carefully written papers.

CONTENT ENRICHMENT IN INDUSTRIAL ARTS COURSES

M. L. Byrn

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Mr. Byrn enjoys the reputation of being one of the most successful and inspiring shop teachers of boys in the United States. Something of his enthusiasm, energy and force of personality will be felt by anyone who reads this interesting contribution.

IT is a long step from the old "horse-and-buggy days" of the manual training theory of shopwork of two or more decades ago to the evolving conception of the industrial arts as a group of subjects fraught with enticing pertinent knowledge that points the way and leads the pupil to greater satisfactions and achievements in the school shop.

The philosophy of an enriched content for industrial arts courses was promulgated by John Dewey over forty years ago; it was re-stated and amplified only a few years later by the late Fredrick G. Bonser. It seems most strange that such a wholesome and vitalizing philosophy of education was not immediately accepted and adopted, especially by supervisors and teachers of industrial arts. Industrial arts educators can today, however, take pride in the fact that they are as a rule at the prow of the good ship "progressive education" helping to guide its uncertain way to a new world of emancipation, discovery, and enjoyable achievement for its cargo of eager, expectant, and poised youth. We must not fail them by gorging them on required, routinized shopwork in woodwork, sheet metalwork, and a smattering of electricity through bell wiring, to the exclusion of a vitalized well-rounded program rich in knowledge content, artistic expression, and well-designed projects, most of which are of their own design or choice, and which serve their own needs. The shop teacher using this method for the first time will be amazed at the interest, response, and achievement of his pupils, and will wonder what has come over the class — what has happened to his former disciplinary problems.

Content Enrichment Through Experimentation and Actual Shopwork

I recently heard a college president make the statement that the average boy is capable of carrying on research problems involving the things he is keenly interested in, such as problems involving electricity, the automobile, boats, airplanes, radio, and the like. Be that as it may, every shop teacher knows that boys sometimes ask questions that would prove embarrassing to the teacher who was not intellectually honest. If the question is not too far afield—and who can be the judge —the teacher should either answer it or encourage and assist the pupil, if necessary, in finding the answer. Fortunately the pathway to progress in industrial arts is nature's way — the easiest, most efficient way. "Every boy, without exception, is born with an inquiring mind; it requires strenu-

ous and persistent effort on the part of the home, the school, and the government to squelch all natural tendencies to ask questions, to investigate, to explore, to pull to pieces in order to see the 'wheels go round.'" The above quotation is from "Developing an Inquiring Mind," an article written by Dr. S. A. Courtis in *Childhood Education,* January, 1940. We, as industrial arts teachers, must utilize this urgent, youth instinct both to broaden his knowledge and outlook on life, and to increase the actual amount of work he will accomplish in the shop. Of all the inhumanities of men to boys, has there ever been a greater one than the way in which we, as shop teachers, sometimes restrict, punish, and eradicate the truly divine tendency of the young of the human species to know and understand his environment, himself, and others? Yes, we who should be most concerned with his development and guidance.

The successful shop teacher will need to keep constantly before him the four native impulses mentioned above, encourage and assist our pupils to develop and use them, and thus make the industrial arts a more vital and effective agency in serving the needs of youth. He must ever keep before him the fact that knowledge is the foundation of all intelligent action whether it be in the school shop, the home, in industry, medicine, or science. Of course, in a manual-performance type of shopwork where the emphasis is on tool manipulation and in routine procedures there is little need for an understanding of the basic principles of art, science, and technology; but where the emphasis is placed upon general education, boy development, and boy life, with each projected undertaking approached thoughtfully as a problem to be solved, there is no escaping the need for access to information and for the acquisition of pertinent special knowledge required in solving the problem. If a boy is to take pride in his work and do an excellent piece of work in either metalwork, electricity, automotive work, or woodwork, it is very essential that he experience the "feel" of accomplishment in knowledge mastery as well as in manipulative mastery.

De Witt Clinton once made the observation that "Pleasure is a shadow, wealth is vanity, and power a pageant; but knowledge is ecstatic in enjoyment, perennial in fame, unlimited in space, and infinite in duration. In performance of its sacred office, it fears no danger, spares no expense, looks into the volcano, dives into the ocean, perforates the earth, wings its flight into the skies, explores sea and land, contemplates the distant, examines the minute, comprehends the great, ascends to the sublime — no place too remote for its grasp, no height too exalted for its reach." While I am a strong believer in the avid acquisition of any worth-while knowledge for knowledge's sake — for the mere joy of knowing — I am doubly convinced that no shop teacher can enthuse and lead his boys into a like frame of mind unless he has a keen and thorough understanding of the many technological aspects of whatever subject he is demonstrating or discussing with them. The inspirational and successful teacher must also be a skillful craftsman in a very wide variety of tool manipulations and processes.

When a teacher says, "But your boys are different; my boys don't seem to care for electricity, automechanics, artmetal, etc.," make up your mind that he does not know these subjects well enough to make them eagerly entered into by boys, or is a poor craftsman, a poor teacher, or all three. How can the blind lead the blind? When automechanics or electricity have been removed from the industrial arts curriculum because boys did not like them, the fault is invariably with the teacher or supervisor.

This type of teacher often complains that boys do not come to shop to study books, but to work. I repeat that knowledge is the foundation stone for any and all worth-while achievement in the industrial arts work. A thorough understanding of elementary electricity as applied to the automobile, a good working knowledge of the principles of the four-cycle engine, and competent instruction will enable any boy of average intelligence to rebuild an engine and get it running in less than thirty seconds after he attempts to start it. It's very simple if you know what you are doing. All engines run according to the principles of chemistry and physics —know your subject, make the necessary preliminary tests and it *must* run if everything checks.

What a field for offering boys an opportunity to experience the thrill and value of knowledge and gain mastery over the many manipulations that must be so accurately done if success is to be achieved! Some of the enriching knowledge aspects of automobiles are: a thorough understanding of the fundamental principles of elementary electricity, the principle of the generator, the starter, the ignition coil (transformer), current regulators, voltage regulators, cut-outs, solenoids, Ohm's law, conductors and their carrying capacities, insulators, etc. Other facts and principles deal with the mechanical phases of the engine, such as types of steels used for the various parts and their characteristics, heat treatment, the implications of the expansion and contraction of metals as applied to pistons, rings, valves, bearings, and so on.

A study of metals and elementary metallurgy are absolutely essential if success is to be achieved in using them. Dull? I should say not! Try this experiment to illustrate ductility, malleability, work hardening, and annealing, and I assure you every boy will sit on the edge of his seat during the entire series of processes, provided the demonstration is well planned and properly executed. Take a piece of number 10 wire that is 12 inches long. Draw to a square, using a draw plate and draw tongs, then to an oval or half-round, then back to a round again; repeat drawing through successively smaller holes till it has been drawn through the smallest hole. Of course, it must be annealed whenever the metal says "anneal." Yes, we must learn the langage of all materials with which we work. Now roll it again and again through the roll forming machine, anneal when required. Roll the strip as thin as possible. How long is it now? If you succeed well, it will be at least 360 inches long!

We have all had considerable trouble in teaching the boys the importance of using a well-tinned copper when soldering. I'll assure you that only the

dullest will ever worry you again by making the mistake of using an untinned copper again, if you will perform the following simple experiment before the class and explain all the technical implications to them: select a copper that is badly corroded, tin the tip well, heat to proper soldering temperature; now touch a piece of wire solder to the copper where the oxides are thickest and count at the rate of approximately one hundred fifty per minute till the solder begins to melt. You will count anywhere from thirty to about one hundred. Deftly wipe the oxides off the tip of the copper and touch the cool end of the solder to the tinned tip; use the same pressure and count at the same speed. Before you can count to two the solder has melted, in spite of the fact that the tip was cooling while you were counting the first time! This experiment shows that oxides are very poor conductors of heat, and explains the absolute necessity of always using a well-tinned copper.

I have mentioned only two of dozens of interesting and startling (to boys) demonstrations that add interest and zest to shop teaching and place it above the category of busy work. At this point I fear a few are saying to themselves, "That's too academic; when does a boy have time to do his shopwork?" The answer to this question is: a better knowledge of the technical phases of shopwork will enable the pupil to think and plan his work with so much greater dispatch that he will in most cases actually get more and better work done. I am convinced of this after over sixteen years of experience in using this practice.

While I have not emphasized the art and social impulses, I consider them of equal importance with the investigative and manipulative impulses. They must be given careful daily consideration and emphasized as thoughtfully and earnestly as the investigative and manipulative impulses.

How Can Content Be Enriched With Greatest Economy of Time?

There are four methods that have been found very helpful in giving the pupils as broad and cultural a background as possible in industrial arts work. They have facilitated the work and greatly shortened the pupil-time consumed on projects involving considerable technical knowledge, and enabled the pupils to go at their projects with dispatch and confidence.

The author has been using study-guides for more than twenty years as a means of giving the boys the best possible mastery of the technical aspects of the various fields of work offered. It is both surprising and gratifying to observe how well the entire class will grasp the related subject matter when given a carefully prepared study guide covering the fundamentals. The plan works just as well when an individual pupil has need of pertinent information that will enable him to attack some special problem requiring a considerable amount of technical knowledge. A class or individual having need of special information concerning a problem to be solved will almost invariably ask whether there is a study-guide to assist them. It is impossible, of course, to have study-guides for every topic pupils in a multiple-activity shop will need.

Pupil-planning sheets for the various types of work are fully as impor-

tant as are study-guides. These blanks are of many kinds, depending upon the subject and grade in which used. We have experimented with various kinds for many years. Perhaps one of the worst sins of omission in shop teaching has been the lack of emphasis on problem solving opportunities offered to pupils. The job sheet idea has very little place in the industrial arts — except perhaps for the dullest of pupils.

Demonstration guides offer the pupil a method of listing the materials, tools, special information, and procedure followed for demonstrations in which the student must know a considerable amount of pertinent knowledge as well as to learn how to do some new process wherein several steps are involved. It is difficult, even for an older person, to remember all the pertinent knowledge and steps in operations new to them.

Factory visitation forms calling for special information as to materials and processes aid materially in making the trip really educative rather than a mere picnic jaunt. A form for a trip through the Hoover Ball Factory would, for instance, have blanks to be filled in giving the following information: the purpose of the trip, — alloys used for making cups, cones, balls, and rollers,—characteristics each element gives to the steel,—steps in manufacturing, heat treatment,—and testing and grading. I seriously doubt the value of such trips unless some means is used to organize the knowledge gained. Such forms serve admirably as a means of review of the trip.

Textbooks and an ample shop library are of far greater importance than is commonly recognized by many teachers and supervisors in the new philosophy of the industrial arts. Ready sources of information are of first importance if the plan is to be a success. The principal avenues for making available to students the technical information they need, in addition to class discussion and demonstration, are: a good shop library *housed in the shop,* a good textbook (if one is available), some of the current magazines specializing in projects and interesting articles that boys like to read, and pertinent publications of industrial concerns that often have the latest and most authentic information available on many of the technical aspects of the work.

In many instances it would, without doubt, be far wiser to spend less money on expensive equipment and considerably more on suitable library facilities. If a boy is repairing a generator, or rectifier, for example, it is of paramount importance that he have access to sources of information that will give him all the necessary knowledge he needs in relatively simple and well illustrated form.

Content Enrichment in Industrial Arts Demands Broader Teacher Education

Our changing civilization clearly makes new and far-reaching demands upon our entire educational program. In no other phase of education have these demands grown more rapidly and been more varied than in the field of the industrial arts, yet there are literally thousands of secondary schools in which the shopwork consists mainly of woodwork, drawing, and still more woodwork to the exclu-

sion of such intriguing fields as electricity, several phases of metalwork, automotive work, concrete, etc. Often when some work is offered in electricity it consists mostly of bell wiring; the extent of metalwork done in many schools is frequently confined to a little "tin can" work with practically no emphasis upon the vital ramifications of the pertinent concomitant knowledge aspects of the work being done.

One of the most conspicuous needs in the training of industrial arts teachers today is a more careful selection of candidates. Intelligence of a higher order is mandatory—not alone the mere ability to remember facts — for every industrial arts teacher. He must be first of all a "problem solver"; this ability is one of the first essentials of intelligence. The successful industrial arts teacher must be a "knower" and a *"doer" in his own field.*

Greater emphasis must be placed upon a good academic background. College physics and chemistry should certainly be a part of the training required of every industrial arts teacher. A good course in elementary metallurgy is indispensable for every teacher of metalwork or general shop teacher. The teacher who knows is the teacher who can enthuse pupils, see solutions and devise means of making shopwork fascinating even where the physical equipment is limited. He is also most likely to be the one with the burning desire to provide means and nurture pupil-growth in whatever field the pupil shows keen interest and ability. He not only can point the way, but can lead the way.

The candidate who has been keenly interested in and has seriously followed hobbies involving the crafts, electricity, metalwork, and the sciences will, by and large, make a far better shop teacher than one who has not been interested in such hobbies. He has already shown interest in and gained a fair mastery of some of the most enriching experiences offered by the industrial arts. These interests and experiences alone give him a "head start" on other candidates. Young men who also have a practical interest in the various phases of art in addition to the other interests mentioned would doubtless make even better candidates. It goes without saying, of course, that candidates for the teacher's certificate in whatever field should have good training in the social sciences, psychology, and education. It is possible that teacher trainers have, in the past, been too concerned about methods of teaching and so-called research — both undergraduate and graduate—and not enough in allowing their pupils to follow their desires and satisfy their greater needs —that of gaining a far wider and better understanding of the technological aspects of the subject they must teach, and a far higher mastery of the ability to do more skilfully the things they must teach their pupils to do.

If the industrial arts teacher is to function successfully in industrial arts as envisaged by practical forward-looking educators, he must have a wide range of knowledge, remain plastic of mind, and have an overpowering urge to gain mastery over more and more content enriching knowledge and over a constantly increasing number of tool processes and machine manipulations. Thus, a broad educational background is neces-

sary if he is to be a successful teacher of electricity, a wide range of metalwork activities, automotive work, concrete work, ceramics, and woodwork. He must have the ability and initiative to apply his knowledge to life situations in a practical way and to design and construct many of his teaching devices and even much of the special equipment in many cases. He must also be well grounded in the fundamentals of psychology and pedagogy, and, above all, he must "have a way with boys."

Teacher trainers of prospective industrial arts teachers, with few exceptions, have championed the cause of a content enriched and re-vitalized industrial arts which places the emphasis upon pupil growth and development through participation in problem solving experiences that intrigue and satisfy boys and girls.

The rather wide acceptance of the real meaning of enrichment in industrial arts, both on the part of teacher-trainers and teachers in the field, augurs well for the future of the industrial arts. Already school executives and teachers of academic subjects are beginning to sense the fact that teachers and other leaders in the field of industrial arts are, and have been for some time, the real instigators and leaders in the field of progressive education.

TRAINING TEACHERS FOR EFFECTIVE INSTRUCTION IN INDUSTRIAL ARTS

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Dean Siepert presents a most interesting analysis of the problems involved in the training of industrial arts teachers. His long and successful experience in teacher training makes this contribution of special importance.

MANY descriptions of the ideal teacher have been given by various speakers and writers. Some have emphasized knowledge of subject matter as the prime essential; others have stressed professional training with particular consideration of methods of teaching. Again, others find peculiar values in subjects that are supposed to give mental discipline, social insight or "culture". A more conservative and possibly more correct position attempts to prepare teachers for effective instruction by including a balanced proportion of several of these proposals.

The teacher of industrial arts is fundamentally not different from the teacher of any other subject. He must be familiar with the general aims of education and must know the specific contributions industrial arts can and should make toward the accomplishments of the desired ends of education. He must know something of the conditions under which learning takes place and specifically how to bring about such learning in the area of his own field. He must have ability to take his place within his own school as any other member of the staff in dealing with matters concerning the common good, and in addition bring something of his special technical skills and knowledge to assist in all-school enterprises. In brief, the

teacher of industrial arts must be a teacher in every sense of that word, if he is to teach effectively.

The training of such a teacher should begin on the secondary level. Somewhere in the junior and senior high school industrial arts classes may be found the lads who should be given counsel in the direction of teaching as a career. The teacher of industrial arts has a tremendous opportunity in assisting such boys in the exploration of various manipulative and constructive activities, the discovery of hidden talents, and the development of deep, abiding interests in all matters relating to the subject. The teacher and the counselor or high school principal have vital rôles to play in selecting those who can be trained for effective teaching. Unless the training institution receives from the high schools individuals with intelligence, character and good health, it will be handicapped in producing the highest type of teacher. Some attempts have been made to improve methods of selective admission, while elimination of those proving unfit is more or less the common practice in most teacher-training institutions.

Suppose we have before us an entering freshman class composed of the best material our institution can attract. What shall be the program of training them? The writer is aware that his answer to this question will not be completely agreed to by all engaged in training teachers, or those directing and supervising industrial arts in the schools. Differences in local conditions, as well as personal viewpoints on aims and methods will be reflected in the practice of various institutions. Three basic needs must be met in preparing the teacher. (1) The subject matter of industrial arts; (2) the professional courses in education required for certification, and to give the teacher understanding of, and ability to use effective teaching procedures; (3) such contacts with that body of learning possessed by educated men and women as will enable him to associate acceptably with other teachers, parents and pupils. The research committee of the National Association of Industrial Teacher Trainers made a preliminary report at the recent convention in Grand Rapids, Michigan, in which Dr. Fryklund, the chairman, indicates that an evaluation of the aims of industrial arts teacher education by administrative officers of seventy industrial arts departments produced seven outstanding aims. These are in the order of rank:

(1) train teachers of industrial arts for public school service,
(2) make students familiar with aims and problems of teaching industrial arts,
(3) supply students with the necessary background of informational subject matter for teaching purposes,
(4) attain a certain standard of shop skill in subjects where skill is demanded,
(5) develop proper appreciations of the significance of industrial arts for its contribution to present-day living,
(6) develop proper appreciation of industrial arts for its own sake—its place in the social heritage, and
(7) promote a scholarly and scientific attitude toward the problems of teaching.

This list is a more complete development of the three basic needs listed above.

We must assume that an effective teacher must know his subject. This means for the industrial arts teacher

the development of skills in the use of tools, proper techniques and processes in each area of industrial arts being taught, and knowledge of facts related to these activities. One of the big problems arises from the fact that industry has become tremendously diversified. The teacher is embarrassed by the wealth of material from which a selection must be made. While the traditional woodwork courses have in part remained with us, continued pressure is being exerted to expand the offering. A clear-cut philosophy of industrial arts education and full appreciation of the specific aims of education to be accomplished will be of immeasurable assistance in this matter of selection. If we refer to a pioneer attempt along this line, we find Bennett's proposal:[1]

(1) The graphic arts (all forms of drawing, freehand and mechanical)
(2) The mechanic arts (wood, metal, etc.)
(3) The plastic arts (brick, tile, concrete, pottery, terra cotta)
(4) The textile arts (spinning, weaving, knitting, braiding, etc.)
(5) The book-making arts (printing, engraving, bookbinding, cardboard, etc.)

Or a more recent and widely accepted suggestion by Selvidge:[2, 3]

The Objectives of the Industrial-Arts Teacher

1. To develop in each pupil an active interest in industrial life and in the methods of production and distribution.

2. To develop in each pupil the ability to select wisely, care for, and use properly the things he buys or uses.

3. To develop in each pupil an appreciation of good workmanship and good design.

4. To develop in each pupil an attitude of pride or interest in his ability to do useful things.

5. To develop in each pupil a feeling of self-reliance and confidence in his ability to deal with people and to care for himself in an unusual or unfamiliar situation.

6. To develop in each pupil the habit of an orderly method of procedure in the performance of any task.

7. To develop in each pupil the habit of self-discipline which requires one to do a thing when it should be done, whether it is a pleasant task or not.

8. To develop in each pupil the habit of careful, thoughtful work without loitering or wasting time (industry).

9. To develop in each pupil an attitude of readiness to assist others when they need help and to join in group undertakings (coöperation).

10. To develop in each pupil a thoughtful attitude in the matter of making things easy and pleasant for others.

11. To develop in each pupil a knowledge and understanding of mechanical drawing, the interpretation of the conventions in drawings and drawing diagrams, and the ability to express his ideas by means of a drawing.

12. To develop in each pupil elementary skills in the use of the more common tools and machines in modifying and handling materials, and an understanding of some of the more common construction problems.

These suggestions, and others appearing from time to time, indicate the continual expansion of the areas of industry from which the raw materials for industrial arts courses are being drawn, and for which the prospective teacher must be trained. While there is recognized difference of opin-

1 Bennett, Charles A., "The Manual Arts," The Manual Arts Press, Chapter I, p. 16.
2 A. V. A. Industrial Arts Section Committee Report, "Standards of Attainment in Industrial-Arts Teaching," pp. 8-12.
3 Bawden and others, "Industrial Arts in Modern Education," The Manual Arts Press, Chapter II.

ion on this point, the writer believes that emphasis must continue upon developing relatively excellent craftsmanship skills in our teachers. There must be had that ability of execution of various technical processes which would command respect at least of the quality, if not the quantity of the product. If industrial arts is to function as an exploratory experience for guidance purposes, the experience must be genuine. While we are not here suggesting that industrial arts is to become a definite preparation for some industrial occupation, we do say that such portion of any occupation as may be selected for teaching purposes must be genuine if the stated objectives are to be fully realized. Again, with increasing attention being paid to the leisure-time activities which becomes possible in the homework shop, the teacher must be able to teach his pupils how to plan and construct such projects as they may wish to undertake. The writer has heard many criticisms of industrial arts teachers, most of which may have been justified, but as regards competence as a good workman, the lack of ability, not the possession of it, has been the item of censure.

A second point of difference deals with the method of preparation. Some teacher-training institutions believe in the unit-shop plan of training. Here the prospective teacher has opportunity to study in one field until he has mastered the material offered. Then he enters a second, third or other field until he is considered competent. The other type of training is given in those institutions which emphasize the general or comprehensive shop or laboratory. Under this arrangement, the prospective teacher is supposed to develop his own technical abilities under the same conditions as those in which he may later find himself as a teacher.

This raises the question as to whether the prospective teacher should acquire his own tool skills under different or the same conditions from those in the public schools in which he expects employment as well as whether these skills are more readily developed under a specialist teaching in a restricted and well-defined area as compared with a "general" teacher with greater variety of tools, materials and processes to direct and supervise. Since there is not agreement on these points, perhaps some reference to other subjects is appropriate. The tendency in other college courses seems to be toward the specialist with equipment provided for his particular needs. The chemist, biologist, and physicist on the faculty are friendly, but each one prefers to have his chance at the prospective science teacher in a unit course rather than to have college general science courses and laboratories as the training ground.

To conclude this matter, regardless of our personal ideas on the problem, the effective teacher will be the one who has been trained in the various phases of industrial arts so that he can plan what is to be constructed, operate machines or use hand tools in a proper manner so as to produce a workmanlike, finished product. He must also be able in those industrial arts areas as are now more and more touching all of our lives, be able to install, adjust, lubricate, repair or replace worn or broken parts. Many present-day articles are produced by processes and under conditions that cannot or should not be duplicated in

schools, but these articles call for consumer education of the best sort when it comes to selection, purchase, proper use and the necessary care and adjustments. Then finally, the equipment with which the industrial arts teacher works, requires proper care. Here both information and skill are called for to a degree beyond that of the high school pupil. How often we can see abused and neglected tools because the instructor lacks the ability and the right attitude to keep equipment in good working condition. A very vital factor in creating the attitudes mentioned in the Standards of Attainment list of objectives is to keep all equipment in the best of condition. Neither the boy nor his parent can have respect, let alone enthusiasm, for dull and broken tools or machines. A besetting sin of many new, and too many experienced, teachers is their lack of ability and interest in equipment upkeep.

The professional training of a teacher of industrial arts is subject to several factors. In the first place, state certification laws may determine both the amount of professional training and the specific subjects. The most commonly found requirements along this line include Educational Psychology, Methods of Teaching, and Supervised Practice Teaching. The methods courses may include either or both General Methods, i.e., a course offered for all teachers regardless of their major and minor teaching fields, and special methods which is concerned with specific application to the problems of the industrial arts teacher.

In the second place, professional training is influenced by the institution in which the teacher is being trained, and by the more or less personal bias of those directly responsible for the teacher training program. The college of education in a large university will not approach this matter of professional training just as will be done in a state teachers college, or in an endowed college. The opportunities available for practice teaching vary widely in extent and kind. The schools of a large city system in which such teaching is done may afford a more nearly normal experience than the training school of a teachers college located in a relatively small community. Again, the larger city system in which students from an endowed college secure their practice teaching experience, may have a course of study and classroom practices over which the teacher training institution has no control and with which it may or may not entirely agree.

There should be little difference of opinion, however, on the fundamentals. The industrial arts teacher must know and be able to apply the basic truths of educational psychology,—how skills are acquired and habits are formed, how facts are learned so that they may be retained and understood in relation to materials, processes, tools and machines as well as the important facts of industry, employment, etc., which belong in present-day teaching. In the realm of methods, the teacher must have various techniques appropriate to given teaching situations. Larger classes, diversified activities, consideration of individual differences, are some of the specific situations for which adjustments and flexibility in methods are essential. Again, present practice calls for far greater organizing ability with respect to pupil personnel. There is fre-

quently less ability needed to solve the engineering problems of power machinery installation involving line shaft-pully and belt drives as compared with the use of machines with individual motors requiring little more installation than a place to plug in for electric current. But it is a more complicated matter to so organize the class that the pupils share in the matter of carrying on all the various activities of the shop in such fashion as to gain a better appreciation of modern industrial practice.

As has been previously indicated, there is not uniformity of practice in the training of teachers. The writer believes that the subject matter of industrial arts is mastered more easily and effectively in each area by specific training in unit shops. With respect to dealing with pupils, there is, of course, the need for very definite instruction in the "theory" classes followed by opportunity for gaining experience in setting up an effective plan of dealing with pupils, supplies, tools, etc. No lecture and reference-reading procedure of teacher training is itself adequate to give the young teacher the confidence and ability which develop only as pupil-teacher experiences are successfully carried out under real school situations.

The third aspect of teacher-training is sometimes attempted by registration in required subjects such as English, history, mathematics or science, etc. There is little evidence of definite trends possibly due in some measure to the make-up of the institutions themselves. Economics, practical or applied mathematics, art and design are beginning to appear more frequently. Extra-curricular activities are attracting more of the industrial arts group. Athletics, music, dramatics and the school paper are some of the activities which bring a wider range of interests and opportunities for service to the school as a whole.

Certificating regulations as well as placement opportunities may enter into the picture at this point. For example, the Illinois High School certificate requirement calls for three teaching fields of at least sixteen semester hours each, or one field of thirty-two and a second field of sixteen. This regulation thus requires the prospective teacher to concentrate in one or two teaching fields in addition to industrial arts. This concentration will take one-eighth to one-fourth of the total degree requirements. Again, inexperienced teachers usually must begin their teaching career in smaller schools, and here the expectation is that they shall carry a fair share of the entire school subject-matter offering rather than to specialize in industrial arts only. The one exception is the industrial arts-athletic coach combination. While this combination may offer a more attractive salary for the first position, as well as greater frequency of occurrence as compared with other subjects, it does have certain very definite drawbacks. In the first place, as coach, he is expected to develop a championship team, or at least win more than half of the games. Failing in this respect may cost him the job regardless of his success as a teacher. Secondly, coaching takes his time after school hours, evenings and Saturdays, thus preventing taking proper care of his equipment. It is noticeable that within the first six years of experience, many give up coaching to devote their entire time

to teaching, or give up teaching to coach.

In conclusion, the industrial arts teacher must have sufficient shop experience to develop a respectable degree of skill. This is essential because he must be able to keep his equipment in good working condition, as well as to demonstrate such procedures as will help his pupils realize the objectives previously listed. As the demand for more areas of activity increases, the teacher must have an increased amount of industrial arts training. This factor is being recognized, for example, in the new Illinois regulations which call for at least sixteen semester hours of industrial arts training devoting not less than eight semester hours of training to each subject or area such as wood, metal, electricity, etc. In the better type of high school, greater amounts of training are being required. Thus we are saying that a teacher with a minor in industrial arts should spend at least one-eighth of his college course in industrial arts classes. Under these circumstances, he should not attempt more than a limited area such as one subject, e.g., wood, metal, or a general shop for seventh and eighth grade boys. As soon as we enter the high school level, there should be training equivalent to one-fourth of the college course, or the "double-minor" requirement of the Illinois certificate. For the upper classes in which more expensive equipment is used and in which better craftsmanship is expected, the teacher should either concentrate his training in the specific area taught, or should have a greater percentage of his college course devoted to industrial arts. Some of the finest teaching the writer has observed is being done by men whose industrial arts background ranges from forty-five to sixty semester hours of training. Frequently, these master teachers also show considerable summer vacation experience in industry.

The professional training requirements are similarly being raised. In several instances, more courses in education are being required by the institutions than the usual state or regional accrediting agencies demand. There appears also to be a tendency to change somewhat from the older formal subjects in education to those making specific application to industrial arts teaching. This involves emphasis upon acquiring an understanding of the objectives of industrial arts, an appreciation of its historical development, and mastery of those phases of good teaching methods distinctly appropriate to the subject itself and the attainment of the objectives set up for it.

The ideal is, as we see it, to train an individual so that he becomes master of the field he teaches not only as a good craftsman, but one who can inspire his pupils to strive for similar mastery. In addition, to develop the best possible professional attitude which will enable the new teacher to became equally effective in the life and activity of the school and community in which he is privileged to serve.

SOME CURRICULUM INFLUENCES

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Professor Smith presents in interesting fashion twenty-six influences which play a part in determining the curriculum in industrial education. He does not say these should be the determining influences but that they usually are.

INSTRUCTORS in industrial education — their principals and supervisors, their superintendents and boards — continually face questions as to what courses to offer and what teaching materials to use. They are concerned with both *curriculum* and *content*. Aside from earned respect for their suggestions, on the part of their professional superiors, the teachers have more influence and right in the realm of content. Decision as to the offering is really an administrative function, with conditions varying greatly from school to school and from state to state. And, since our foremost leaders are in seeming agreement that standard, wide-area patterns are impracticable if not impossible, the selection of fields and courses becomes a local problem. True progress on the whole and worthy arrangements in individual situations will be assured by better understanding of departmental purposes and of changing national practices.

The writer has earlier reviewed approximately three hundred considerations which have place in our thinking about the curriculum or offering alone.* These numerous concepts about the curriculum, without specific reference to content, are not explained in the article mentioned but are merely listed in six groups. The captions or separators there used are —"Some Practical Influences," "Some Confusing Modifiers," "Some Matters of Scope," "Some Patterns of Planning," "Some Questions of Emphasis," and "Some Types of Assistance." In the present discussion we limit ourselves to the first of these six groups or sets, namely, "Some Practical Influences." We desire a closer look at these rather homely, day-to-day factors, these determinants or modifiers that set or change our plans almost without our knowing. We need to be more aware of what impels or impedes us as we accept or reject a specific industrial subject. We are similarly pushed and pulled with reference to the content of fields and of the courses within them. *But, content must await a later treatment; we think here only in terms of curriculum or offering.*

This article is grouped with others in a publication chiefly concerning Industrial Arts as differentiated from trade education or training. This circumstance does not warrant separation of the factors influencing curriculum construction in industrial education as a whole. There is strengthening justification for our viewing these two phases of the field as parts of a continuous process for an increasing percentage of pupils and patrons. In these days we think of objectives, subjects, content, method, equipment,

* "Curriculum Revision," Industrial Education Magazine, Vol. 41, pp. 57-60, March, 1939.

teacher preparation, and the like in terms of emphasis rather than of distinctness. We list here, therefore, with brief explanation, some two dozen items that may well be kept in mind as we make our decisions as to what courses to use in the matching of either general or vocational aims. Some of these influences are stronger or more worthy than others for only one of the phases of our work. Likewise, some of them may be considered more defeating or acceptable in curriculum work as a whole.

* * *

1. *The Traditional List of Courses or Fields.* We tend to continue our present doings, in this as in other matters. The prevalence of woodworking and drawing urges us to retain them and to begin with them. Additional subjects are often introduced, as specific supplements, in the order of their frequency of adoption within the national growth or in the state program with which we are most familiar.

2. *Well-advertised Schools or Systems.* Certain cities and schools become well known by reason of leaders of great ability and energy, by virtue of the policy and means of giving publicity to their programs, etc. Such cities and schools are, in the main, a helpful influence because they "put leaven in the lump" and "stir us to action." When leaders elsewhere desire to inspect, with purpose to expand or to improve their own offerings, they are naturally attracted to these outstanding places and persons. Observation trips are made in many cases to cities and institutions quite unlike the home environments which must be considered and matched in planning.

3. *The Grades Assumed to Participate.* Obviously, a system which begins industrial arts in grade five, with special workplaces and instructors, must make provision different from that made where the specialized instruction is withheld until grade seven. In the same way, an industrial program ceasing with the tenth year must be different from one continuing to the close of the high school or of the junior college. Some systems ignore unemployed youth, workers under twenty-one, and the job learners, changers, and continuers at a variety of adult ages. Some fail and others do not fail to consider the developmental, employment, and leisure needs of girls and women. Groups direct us to courses.

4. *The Size of Town or School.* A host of towns are of very small and trying size. Beyond this, in increasing population, communities face ever lessening difficulties in the matters of pupils and teachers. Schools present administrative restrictions in adverse keeping with their enrollments. Necessary duplication of classes, sections, and instructors provides latitude and makes variety of offering convenient. In this connection it may be mentioned that the "general shop" or "laboratory of industries" has been a great boon to the residents of smaller communities. It has enriched the curriculum.

5. *The Nature of Town or District.* The little-industry, diversified-industry, or one-industry nature of a school district should not materially influence the offering at one level but should influence it greatly at others. The work for grades five through nine need not give strong indication of a granite, or textile, or steel, or pottery town. Beyond this age or grade level,

and on into the part-time and evening program, the pattern of industrial work should reflect and should be closely geared to the community type and progress.

6. *Money and Space Available.* As in paragraph four above, we must note here that money and space are cogent influences when offerings are in question. As school size requires more shops and drawing rooms, and as more money is spent annually for departmental needs, it becomes easier to provide a broader array of courses.

7. *Differing Costs of Subjects.* If an administrator were to have the privilege to plan a multiple-shop department, and there were no present equipments, supplies, etc. to be considered, the matter of differing costs would not be so strong a determiner. Usually, however, certain subjects are present and decision must be made as to what other subjects can be added to them. Perhaps extra space at such a time is more of harm than help. But, whether to install necessities representative of additional fields, by mixed inclusion with those at hand, or whether to meet the minimum needs in initially more expensive subjects is the question commonly met. The more worthy subject often fails of selection under such circumstances. We would have more printing, for example, if it were not comparatively simple and cheap to put electricity in a wood shop or art metal in a place prepared for bench metal or sheet-metal.

8. *Financial Abilities of Students.* There are varying abilities among pupils within a school with regard to meeting the costs incident to industrial instruction. Likewise whole school populations differ in economic status, though but short distances apart and even within the same system. Some boards of education exact no special course or material fees while others find it necessary to impose such extra payments. Perhaps these differences most commonly determine selection of projects within a course. It is important to realize, however, that subjects themselves are unlike in costs beyond those of initial outlay and upkeep.

9. *Diploma Requirements.* Some high schools of their own desire or by state regulation have graduation codes which limit credit in "special" fields. Industrial education suffers pupil loss by reason of this fact and a lower-than-natural departmental enrollment is reflected in an offering below possibility.

10. *College Entrance Limitations.* The influence of higher institutions upon, and, in many cases, their virtual control of the high school curriculum, has long been a defeating circumstance. While this condition and that mentioned in the preceding paragraph are showing gradual improvement we are still unduly restricted in the number of pupils served and, therefore, in the variety of industrial fields represented.

11. *Agencies Coöperating With the Schools.* In some communities the schools are practically self-contained while in others coöperative relationships exist which encourage broad offerings and actually reduce formal costs of operation. Where social, commercial, and industrial groups are drawn into the service of the schools the support of the "practical" courses is assured.

12. *Successes and Failures in Placement.* Above the level of the strictly

general, industrial arts, aims and practices we think in terms of initial readiness for earning. We are drawn toward those subjects which have presented most opportunities for placement and away from others that have built the opposite record as to usefulness.

13. *Guidance Services of the School.* It seems to have been established that a good guidance program results in the retention of pupils as well as in the better orientation of each pupil to his life and work possibilities. By increasing the enrollment as a whole and by lengthening the average stay of each individual, guidance increases the number and the kinds of industrial courses. This is true even under general and exploratory aims, and at the level of vocational preparation there can be no question that good guidance begets better industrial offerings.

14. *Publishers of Texts and References.* It is not only the occasional, welcome visits of the agent—not only the catalogues, the descriptive circulars, the reviews, and the convention displays—that suggest aid to our field through books. We are helped by the very fact that books are conceived and manufactured. Courses have often preceded the texts and references useful in their conduct, but just now we are having an opposite experience. We are deciding to offer certain subjects because good printed materials in these subjects have been made available. Publishers are not only encouraging the broadening of the industrial education curriculum; they are initiating the process in thousands of schools.

15. *Equipment and Supply Firms.* Here, again, an out-of-school influence has had marked effect in the stimulation as well as in the improvement of our work. Many of the paid advertisements which these firms prepare are professional more than commercial in tone. Chief aid has come, however, through the greater availability of improved types of the things we need. Still other subjects will find place in the schools when they can be as easily inaugurated and continued.

16. *Trade Union Attitudes.* Organized labor may be credited, generally, with true support of trade education and particularly when federal or state legislation has been in process. Labor's influence on the vocational curriculum may be characterized as one of coöperation to expand the program and to check against exceeding quotas in certain limited fields. As to industrial arts work we do not fully realize the help we have had from the men and women of industrial pursuits. They have consistently encouraged the strengthening of schools and the inclusion of the special curriculum areas within them.

17. *Attitudes of Employers.* The leaders in industry seem to have no common policy with regard to industrial arts. Many of them have thought it a "frill" to be tolerated in prosperous times and to be discarded at other times in favor of lower taxes. They have never exhibited real, challenging appreciation of its broad-base value in the meeting of their needs. As to trade preparation and upgrading there has been, generally, a good coöperative attitude on the part of those who depend upon skilled mechanics. The point to be made here is that we can increase our offering in rather direct ratio to our success in interesting and

coöperating with the employer and his workmen alike.

18. *Whims of Influential Citizens.* Some few people in each school district exert real influence upon the costs and the values of schools. While not students of education they hold strong personal views concerning what should be offered. A man may desire that the town schools be like those he knew as a boy. Another, a lumber or hardware merchant, may appreciate the presence of woodwork. The local job printer may not understand that a new school print shop would soon increase his business, etc. It is our privilege and responsibility to build justifying briefs for all subjects of our choice.

19. *Standards for Aid, State and Federal.* State aid to industrial arts is not widespread but federal aid, and often state aid, to vocational industrial programs is universal in the nation. Where there is aid there must be standards and these standards are usually expressed in minimum terms. Administrators tend to confuse encouragement and support. This all results in modifying our curriculum attempts. As the years pass we come to realize that a well-based program can be broadened and intensified by making use of the allotted monies with their usually fair requirements. It is worthy of note, however, that many excellent programs are supported without reference to the availability of federal funds.

20. *Results of Vocational Surveys.* In years gone by, many of the larger cities invited special survey groups, chiefly men from distant places, to make detailed studies and reports on their occupational needs and training provisions. Today most school districts, large and small, make continuous studies which provide the basis for their vocational education programs. These constant checks, by those locally interested and responsible, tend to broaden the offering by justifying fields and courses not necessarily useful elsewhere.

21. *State Supervisors and Syllabi.* Great differences exist among the states as to stimulation and suggestion concerning industrial arts work in the scattered school systems. Some state offices are without trained leaders in this important field, provide no systematic helpful visitation, issue no publications pointing to improvements in general or for schools of varying types. Other states are active in these ways and all states, with federal encouragement, are influencing vocational offerings and practices.

22. *Abilities of Instructors then Employed.* When an administrator has made decision to extend his industrial program he first examines in detail the preparations of the instructors who then comprise his staff. Without much thought of more valid criteria of selection he then considers courses which can be offered without change or increase of teaching personnel. Many schools of long and successful record in industrial work are now ignoring newer courses because their men are not prepared to teach them.

23. *Intelligence and Aptitudes of Students.* These important characteristics are of broad range among students, among industrial departments under compulsory or elective plans, and among whole schools or systems as such. They should modify somewhat the choice of subjects included in programs but should have much greater influence upon content,

activities, and management schemes within courses that are selected by consideration of other factors.

24. *Competition of Non-public Schools.* Here, again, we have a strong influence in some districts and one without significance in others. Perhaps denominational schools serve elementary and high school pupils in large percentages; perhaps, an endowed vocational school is present; perhaps, private or profit schools or corporation schools have made important growth. These conditions, where present, lower the public school enrollment and, consequently limit the industrial education offering. Coöperative plans of several kinds are now making encouraging advance in this connection in many towns and cities.

25. *Service of Advisory Committees.* This modifier applies strictly or chiefly to vocational programs. Experience has shown that representative committees of educators, employees, and employers guarantee the expansion and improved conduct of training plans. Undoubtedly, they influence industrial arts work in incidental ways.

26. *State Wide Examinations.* This device for the assumed betterment of scattered schools and departments has met much adverse criticism. Opponents of the practice hold that these examinations cripple local initiative as to offering and put premium upon drill in the more standard phases of subjects. Administrators and teachers, free to select courses, content, methods, and devices, without consideration of such tests, are more likely to provide more subjects and to match pupil needs more closely.

* * *

Without doubt experienced administrators and supervisors could extend this list of modifiers. Teachers, generally, could supply specific cases in illustration and could add points that have failed of mention here. The list is deemed sufficient to make us conscious that many facts and foibles play their parts in the important work of program building. These factors, while less worthy than some which might be named, are present and effective. We need to have them in mind. We must learn how to use them and how to circumvent them as our several situations may require.

TEACHING LOADS IN INDUSTRIAL ARTS EDUCATION

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Professor Ericson sets out clearly the factors involved in determining equitable teaching loads for industrial-arts teachers. He has made careful studies of this problem and is specially well qualified to deal with this subject.

MUCH has been said about the relative instructional load that should be assigned to industrial arts teachers in comparison to teachers of the so-called "regular" subjects. Administrators and teachers of subjects other than industrial arts have been inclined to feel that in this field of work, class organizations and methods are such that teachers are favored. When this feeling is expressed or allowed to influence teaching assignments it is usually based upon the thought that industrial arts teachers need not make the preparation for classroom teaching, do not have written papers to evaluate and correct, do not give written examinations, can let students work with a minimum of attention, and on a number of similar lines of reasoning.

Industrial arts teachers on the other hand are prone to feel that their position in the school is misunderstood, that good teaching in this field requires all that other subjects demand, plus a great many extra details and responsibilities. Usually they confine their reactions to talk among themselves and do very little to clarify their position to those who are not familiar with their instructional procedure, many of whom would become more sympathetic if they were better informed.

In discussing teaching loads for industrial arts teachers a number of factors need be considered. Among these are the following:

1. Number of actual teaching hours per day.
2. Length of periods for this type of teaching.
3. Degree of homogeneity of students.
4. Size of classes.
5. Physical facilities for teaching.
6. Types of activity carried on.
7. Teaching methods and philosophy involved.
8. Extra-curricular demands upon teachers.

Each one of these will be discussed briefly in following paragraphs.

Number of Classes Taught. In many school systems it appears to be the custom to assign the industrial arts teachers to a program of continuous teaching for the full school day, while teachers of other subjects are given some free time. The reactions of the former group to this condition is normal and to a great degree logical. Their arguments would be that if the teacher of mathematics, English, history, etc., can claim a free period, so can they. Modern industrial arts teaching requires a large variety of activity in order to satisfy boy interest. While the regular classroom teacher has one topic to prepare for

discussion, the industrial arts teacher must have ready a dozen plans and ideas for the day. In addition there must be materials in readiness, and tools kept in constant condition for work.

There might have been a time when many so-called shop teachers, because of lack of training and vision, simply told the boys to "go to work where you left off yesterday." Today industrial arts involves a study of materials and phenomena concerning industry as well as tool processes. It includes study about occupations and occupational opportunities, safety practices, intelligent consumption of goods and services, and definite training in coöperative living in social and work situations. To make these experiences a part of the industrial arts program requires time in preparation on the part of the instructor. He needs it just as definitely as teachers of any other subject in the school.

Length of Class Periods. The length of class periods obviously has relationship to the teaching load as counted in number of hours taught. During recent years a definite practice has been to make the industrial arts periods of the same length as for other subjects in the school. While this change was objected to by many industrial arts teachers, experience has proved that it did not destroy the effectiveness of the program. But shorter periods and consequently more of them call for more planning for laboratory work, more frequent demonstrations and presentations of information material, and more constant checking on tools and equipment, to say nothing of providing storage space and identification precedures for the work of the added groups. While under the double period schedule there was no doubt, justification for the feeling that in industrial arts the teacher could well have a longer program as measured by total time, there is with a single period adaption, every reason to argue that, considering all details involved in this type of instruction the teacher is often at a disadvantage, period for period, with most of his fellow workers in the school. Industrial arts in modern education is receiving equal status with other subjects in the curriculum. It cannot do justice to that status, however, unless the teacher is given equal consideration to other teachers in regard to teaching assignments.

Homogeneity of Pupils. The load that the teacher can handle, and at the same time be efficient in his work, depends upon many other factors, however, aside from the number of classes or teaching hours assigned. In industrial arts the drain upon the teacher's energies is often increased by unnecessary mixing of pupils of various ages and grades. The possibilities of placing first and second year mathematics students, or first and second year history students in the same class would not enter the minds of administrators and program advisors. But in many cases after care has been exercised to keep everything regular for other teachers, the left-overs, scrambled in a great variety of ages, classification, deportment record, interest and ability, are sent to "take shop."

There is no intention here to claim that in all industrial classes there must be a single group with reference to age and grade. But the point needs emphasizing that as the variety increases, the pressure upon the teach-

ers increases, necessitating more time for planning and maintenance of routine. And it might also be added that there can be no advantage in multiplying, by careless scheduling, the individual differences in a group to the point where it will become a total impossibility on the part of the teacher to serve them with any degree of effectiveness.

Size of Classes for Industrial Arts. The size of classes that industrial arts teachers should handle has been a subject of much discussion. The teacher might well point out that in this type of work individual contact with pupils is a prime requirement. Without reasonable opportunities for personal attention to the problems of each member of the class the most important outcomes sought would be lost. And such a viewpoint is well taken for obvious reasons that need not be discussed here.

The administrator, on the other hand, is faced with problems that are not well understood by the teacher, the greater per capita cost in industrial arts being an important one. During the past decade a general tendency has been to increase numbers in industrial arts classes. In many cases this has been done from sheer necessity, but sometimes arbitrarily without a study of probable results; and worse than all, without material provisions for taking care of the increased numbers. Adoption of new teaching techniques by versatile teachers has helped to keep the larger number of objectives still attainable with considerable increase in the size of classes. However, there is obviously a point beyond which opportunities for any semblence of planned activity cannot be offered. Just where that point is will again depend upon a combination of factors.

Physical Facilities for Teaching Industrial Arts. One of the chief factors that would determine the maximum number for industrial arts classes is the size and condition of the shop or laboratory in which the teaching is done. In general when class enrollments are increased, reduction in learning opportunities do not come from the increase in numbers as much as from the fact that little or no attention is given to a corresponding remodeling of the shop or laboratory for the increased load. To place thirty-five pupils in a room that was built and equipped for twenty-four will mean not only lack of facilities for the added number but also the disorganization of the program for all. In buildings constructed within recent years where plans have been made for larger numbers to be accommodated in industrial arts and where the administration has been frank in dealing with the problem of rooms, equipment and supplies, classes that a few years ago would have frightened most teachers are being cared for under an orderly procedure and with good results. Something more is needed, however, than simply to decide that it isn't right that Mr. Jones in industrial arts should have fewer pupils in his classes than Miss Smith in English.

Types of Activity Carried On. It has been implied in this discussion when making comparisons between industrial arts and other subjects that the type of subject taught will determine to a great degree the number of pupils for the class. This is also true within the industrial arts offerings themselves. A class in mechanical drawing for instance, where problem

or work books can be used to advantage and where students are confined to a limited working space, might consist of thirty or thirty-five students although the latter number is probably too high. In a course in radio twenty might draw more upon the teacher's energy and time. Similar differences would exist between other subjects depending upon working conditions, the nature of the work, and the types and temperaments of the pupils. These points are made to emphasize the thought that one cannot justly stipulate a uniform number for all classes in industrial arts.

Teaching Methods and Philosophy. Within relatively recent years a rather definite philosophy of industrial arts in general education has been developed and crystallized. This area of learning is no longer thought of as "busy work" or as simply acquiring a few skills while producing some articles of sheer utility. Space does not permit elaboration at this point, nor should such elaboration be necessary to any person acquainted with modern aims in education. Suffice it to suggest that if the modern industrial arts teacher is to be expected to interpret the best of the objectives generally agreed upon for this school activity and to attain the proposed social and economic goals which are so promising here he must not be looked upon as being parallel to the school mechanic or a "glorified janitor" when dealing with his work assignments.

Extra-Curricular Demands Upon Industrial Arts Teachers. The industrial arts teacher can and should be expected to take his place beside other members of the instructional staff in connection with extra-curricular responsibilities. These normally would consist of club activities, play productions, home visitation, etc.

But what he should not be expected to do is to be a "handy-man" to the principal and his fellow teachers. Many administrators have a traditional feeling, probably retained from the time when practical mechanics and janitors were called upon to do shop teaching, that the teacher of industrial arts should be available to repair furniture, electrical appliances, repair cars, be superintendent of buildings and grounds, and do similar needed work. These assignments in many places make it impossible for the teacher to teach his classes and keep his self respect. This discussion is not intended to condemn entirely the practice of expecting the classes to work on school projects where the projects are planned into the course in an orderly way. The difficulty, however, even with such "projects" is that often too little time is allowed for their completion and the teacher is saddled with the responsibility of working nights and week-ends in the final rush.

There is another drain on the time of the wide-awake industrial arts teacher; one that is seldom appreciated by others. The very nature of his work makes it imperative that he spend considerable time in visiting practical work in industry and in studying commercial articles and products. Still another is the needed attention to supplies and equipment inventories, not to mention the upkeep of the equipment in use.

All these things should be considered carefully by administrators in their attitude toward the work-load of industrial arts teachers and if they

are so considered it will probably be found that the teacher of this subject who is keeping up a live program is spending an amount of time on his work well above the average of the teaching staff.

In Conclusion. In an attempt to summarize briefly the points discussed and to stress more specifically a number of them the following is presented.

1. Where single periods are used and where the teaching is done according to the modern conception of spread and values in industrial arts the teacher's load should be considered on the basis of an equal number of periods with other teachers in the school.

2. In case of double periods or longer it is legitimate to consider a larger number of hours for industrial arts, provided that the teacher is not unduly overloaded with extra duties some of which need to be allowed for during the regular day.

3. It is an injustice to pupils to be mixed together in such a heterogeneous mass that opportunities for learning are greatly reduced. In most cases such mixing is the result of poor administration rather than of necessity.

4. Classes cannot be expected to be so large in industrial activity as in sedentary classrooms. Reasonable classes in this work should not go above thirty in membership.

5. However, physical facilities for teaching are more important than numbers. A class of twenty is too large if there is equipment and working stations for only fifteen.

6. The type of work carried on and the type or types of students enrolled have to do with teaching loads. Maladjusted students or those needing an undue amount of personal attention draw heavily on the teacher's time and energy.

7. Modern philosophy places industrial arts in the general education program as a fundamental necessity because of its many unique opportunities for promoting personal development and pupil growth and adjustment. The acceptance of this philosophy places the industrial arts teacher in a unique position as an educator by the side of other members of the teaching staff.

8. Extra-curricular demands are normally extremely heavy on industrial arts teachers. They should not be foolishly increased by the assignment of menial jobs that a janitor or mechanic can do. The modern industrial arts teacher's time is too valuable to be so used.

9. And by implication it has been suggested that administrators should stress the need for professionalization of industrial arts teachers in their schools who for some reason or other have failed to grasp the larger meaning of industrial arts. When making new appointments they should be sure that the applicant is aware of the broad meaning and possibilities of industrial arts education, and have the professional training that will enable them to put these possibilities into practice.

TEACHING METHODS IN INDUSTRIAL ARTS

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Professor Friese has for many years been a careful student of the problems of method in industrial-arts teaching. His presentation of his conclusions here will be of special interest to students of educational method.

METHOD in education refers to the ways that have been tried out and established through which we are able to get others to exert themselves and learn things (1) intellectual, (2) manual and (3) a combination of both. Industrial arts has special contributions to make to learning because, as it is now conceived and practiced at its best, it demands methods which can contribute to each of these three learning situations.

In referring by name to a "method" let us admit the desirability of variation in the practice of it in different teaching situations which the alert teacher recognizes. Let us think of a "method" of teaching as a general pattern rather than a crystallized technique. Let us also distinguish between a method and a teaching aid by recognizing that the former is the principal pattern for teaching either part or all of a lesson and that the latter is an incidental device introduced to assist in the general learning process. A picture or two flashed on a screen may be a teaching aid in one instance. Under other circumstances a visual way of teaching may be the chief "method" of a lesson with the teacher's supplementary comments as the "teaching aid.'

Let us not confuse method of teaching in industrial arts with various other things that an industrial teacher does which are sometimes spoken of as "methods," such as the mode of problem selection, or the technique of doing manipulative work with hand or machine tools, or of the craftsman or quantity-production procedure of making things. In this discussion we are concerned with the desirable changes made in a learner through the various ways employed by the teacher in stimulating him to learn.

Relationship of Method to Other Aspects of the Complete Teaching-Learning Situation in Industrial Arts

The classroom-type situation is employed only on occasion in industrial arts. Usually a real-life situation is approached for many students. Many aspects of life are going on concurrently in a shop. That is what makes industrial arts one of the few remaining outposts in modern school buildings of an earlier education learned through real-life experiences of home, work, play, and so forth. Included in this admittedly more desirable natural and complex learning situation than exists in the classroom are activities not generally considered a part of teaching method but which are real and necessary if the entire group of values inherent in industrial arts are to be realized. These activities affect method and are in turn affected by method.

Class management. This is an example of a combination of the personnel work and foremanship of indus-

trial life. There are occasions when the learning desired comes only through directed giving and following of instruction (orders). At other times individual initiative and undertaking is the type of learning desired. The two types demand different modes of class organization and management if full values in learning are to result. Individual development through creativeness (craftsman way) is difficult to accomplish when class organization is based on routinized instruction, work and control. Both types have an important function for most normal students. The richness of industrial arts lies in its naturalness plus adaptability to differently planned educative outcomes.

Shop management. Control of supplies, equipment, monies or credits, articles made, publicity and safety are some of the aspects of control of inanimate things that affect method and are affected by method. For example, if an industrial arts teacher is circumscribed by rigid regulations concerning kind and amount of supplies, or use of equipment, or lack of equipment, or multiplicity of records of physical things, these regulations most certainly tend to require him to routinize many of his teaching responsibilities. This in turn affects the vehicles (articles made) through which he accomplishes learning, and in turn again the number and variety of *methods* used, subject-matter covered, and goals reached.

Briefly stated, method in industrial arts cannot be planned, controlled or justified solely on the basis of a philosophy of method. Other factors, such as the two just discussed, must be considered jointly with method in planning desirable educational outcomes in industrial arts. Some of these non-classroom aspects of industrial arts always influence method in a measure.

Aims of Industrial Arts Achieved Through Method

In studying method in its relationship to courses of study and lesson plans it is important to keep in mind that all outcomes are affected by the teacher's method, and that one outstanding aim or contribution of industrial arts is achieved almost solely through method. Instruction intended to develop manual aims such as handyman skills, try-out for guidance, and hobby work require the use of certain methods. Aims that are essentially informative in character, such as consumer knowledge, technical information, and guidance, demand competence in "classroom" methods. Appreciational outcomes frequently are based on manual and informative content and their accompanying methods. The child-unfolding or developmental aim can be made one of the oustanding ones in industrial arts because of life-like learning situations and opportunities for the development of initiative, of "planning" aptitudes, of creatively directed mental and manual work, and of the exercise of judgment of objective results of all of these.

Some desirable aims in industrial arts can be achieved only through methods that are essentially indoctrination. The child developmental aim, however, can be achieved in industrial arts only when the learner has been provided with the tools of learning industrial arts (manual skills and intellectual background), but these alone are insufficient. A teacher's method must then be added which provides

the learner with learning experiences into which he projects himself in *increasing degrees*. This is a unique potentiality in industrial arts when rightly conceived and skillfully taught — an exhilarating experience for learner and teacher.

Planning in the Use of Method is Necessary

Few developments of real and lasting worth occur without preliminary analysis and careful planning. Enduring structures, machines, agricultural improvements, music, art and agencies for social betterment are examples. This fundamental truth applies to education also. Method being frequently equal in importance with subject-matter in education, it is apparent that most careful scrutiny must be given to the methods employed in providing educative experiences. This is particularly true in industrial arts where the aims and methods are at times numerous and varied in character because of joint emphasis upon manual, informative and appreciational content.

With the wealth of learning methods available for use, it is educationally short-sighted and wasteful to permit industrial arts to be taught other than by means of carefully thought out use of methods. Who would build a bridge of steel, stone and cement from piles of these materials located at a site without first developing the best possible plan? To teach an industrial arts course or a lesson without analysis and planning is just as absurd.

This means then, briefly, that the philosophy of a school, the aims of a course, the character of the subject-matter, the grade level, the physical conditions under which the class operates and other factors call upon the industrial arts teacher to plan a way of teaching before meeting the class or teaching the course. Finding a way of teaching on the spur of the moment is an inefficient and slip-shod procedure. Here the desirable results accruing from careful selection of methods are largely lost. Reliance upon inspiration is a poor substitute for careful analysis and planning even in art and music. Few of us are so richly endowed that we can omit the more painstaking way of careful planning if we are to accomplish what we hope to do. This is especially true in industrial arts where there is richness of both life-like learning experiences and methods, if one but recognizes the fact. This variety of methods is educationally valuable not only to provide particularly effective methods or combinations of methods for designated learning units, but it is also valuable in industrial arts just because of the stimulation and interest that comes from providing a variety of ways of learning in the fields of the manipulative, the informative and the appreciational.

Methods and Desirable "Carry-over"

The answer to the question of transfer of training or carry-over from one experience to another is still unsettled. Studies made over the past forty years show that under some circumstances small amounts of transfer appear to take place. One of these conditions centers around the methods of teaching. If the teacher's way of teaching calls for analysis, comparison and thinking about comparable situations some transfer may occur. The judgments of twenty-four prominent

psychologists concerning transfer of training are included in the Report of the National Committee on Mathematics Requirements.[1] These psychologists rendered judgments on seven statements about transfer. One of the conclusions recorded in this survey follows:

The amount of transfer in any case where transfer is admitted at all is very largely dependent upon methods of teaching. This is probably the strongest note struck by the psychologists in their comments. Twelve of them out of twenty-four make some explicit reference to this matter.

Apparently a considerable number are of the opinion that the way a teacher teaches has an important bearing upon whatever amount of transfer actually occurs. In other words when a teacher tries to get learners to understand relationships and parallel and comparable situations there is more likelihood that the students will be able to make some "transfer" to other somewhat similar situations. This factor is important in industrial arts because of the many natural opportunities which exist for correlations.

Correlation and Methods in Industrial Arts

In real-life experiences many aspects are woven into an integrated whole. Under average American school conditions the nearest approach to such desirable learning situations is to provide all possible correlations. Industrial arts abounds with these opportunities, between the manual and informative aspects of a given subject, between different industrial arts subjects, and between industrial arts and numerous other subjects. In bringing about these admittedly desirable relationships and contacts, one must provide a supporting educational philosophy, an organization, life-like subject matter and a way of teaching (methods). One cannot bring about the desirable educative results of correlation without the unifying agency of method. How the teacher plans and executes the learning process, how he gets students to think, analyze and see relationships between different aspects of his industrial arts experiences and his other school experiences are a fair measure of the amount of correlation that occurs. We have a right to expect such teaching in industrial arts today.

Unique Learning Situations in Industrial Arts

Varying degrees of problem-solving are attainable through so-called "problem" methods. It remained for industrial and agricultural education to bring back into American education real-life learning. Physical education and the arts have been added. For all boys and some girls in most schools industrial arts is about all that is left of an earlier education which employed *all* the senses as avenues of learning, not just the usual two, seeing and hearing. To learn through touch (feeling) is extremely important to a large majority of our youth, those who are not "academically-minded." It is an important way of learning that most of us must follow in our adult life. Both of these conditions argue for more "learning by doing" combined judiciously with the methods which call chiefly for use of the other four senses.

Such teaching demands a judicious

1 "The Reorganization of Mathematics in Secondary Education," Mathematical Association of America, Inc., 1923, especially Chapter IX.

use of the educational project (project method) as culminating experiences. In industrial arts this means, (1) seeing or feeling a need for something, (2) analyzing and making some kind of plans to fill this need, (3) making the thing or doing the job and (4) determining its acceptability and better ways of doing. The last aspect is especially important. In industrial arts this judgment can be based upon a concrete piece of work that can be measured objectively. It stands there, a lasting reminder of partial mental and manual accomplishment, something readily evaluated by a learner. This culminating type of learning experience in industrial arts develops such desirable personal attributes as initiative and perseverance, ability to analyze, plan and execute, and it provides very necessary satisfactions in terms of results that have intrinsic worth as well as educational value.

Someone has said that an education of ideas only is dangerous to ninety percent of our population. Industrial arts, richly conceived and taught, provides learning experiences through combinations of ideas, materials, tools, operations, products, appreciations and *ways of learning* that are unique. Through the judicious selection of methods industrial arts has been adapted to the needs, capacities and interests of youths of low, average and high general intelligence. Our best industrial arts teachers are doing these things, in considerable measure through method.

SAFEGUARDING SHOP STUDENTS

M. K. Humble

The material here presented by Dr. Humble deserves careful consideration because it is based not only upon years of successful experience as a shop teacher but upon an extensive research project conducted by him recently. His conclusions are all outgrowths of a most thorough study.

ON the basis of reportable accidents that occur in our public schools, it has been estimated that practically the same number of accidents take place in the academic classrooms as in industrial education shops. This comparison is interesting, because many school people, as well as parents, are of the opinion that the school shop is potentially a dangerous place. The shop, in some respects, is a dangerous place for children of school age, and the fact that there is danger cannot be denied. However, modern safety provisions and practices used by well-trained and thoughtful teachers, supervisors, and administrators have made the school shop one of the safest places in the entire school. Most modern machinery is equipped with devices designed to afford maximum protection to the operator, and they make the operation of the machine reasonably safe. However, guards and safety devices on machines afford only partial protection. Safety engineers generally agree that a great majority of all accidents are due to factors that cannot be guarded against with mechanical devices. The chief cause of many accidents may be called the human fac-

tor. In spite of all efforts to protect pupils from accidents, an occasional injury is reported which is due to negligence on the part of the school or its employees. A few states have met this problem by providing compensation for pupils injured under such circumstances.

Physical Provisions for Safety

Power machines used in industrial-education shops are sources of potential danger,' even when the machines are new and are provided with the best possible guards. When purchasing new machines, it is important that great care be used to secure machines that have adequate guards over all driving mechanisms and at the point-of-operation. Reputable manufacturers of machines used in industrial-education shops recognize the importance of safety, and have incorporated many safety devices into new machines. Drives which are an integral part of the machine, inclosure guards over fast moving parts at the point-of-operation, and brakes which stop fast-moving machines, such as the jointer, are some of the safety features that should be required on new machines.

Many shops are equipped with machines that were purchased several years ago, and a large number of these machines were not provided with adequate guards at that time. It is not advisable in many cases to discontinue the use of the machines because they are out of date and not provided with the best safety features, but such machines should be checked very carefully to see that they are in good repair and they should be provided with adequate safety devices. Sometimes it is not possible to purchase a manufactured guard for some old machines, and in these cases the teacher should design and make an effective guard for use on such machines. Above all, the teacher should see to it that all machines are well guarded.

The proper arrangement of machines and equipment in a shop is of vital importance in protecting pupils. Machines should be so arranged that the operation of any one machine does not constitute a hazard to anyone other than the operator. This is of special importance when locating such machines as the power table saw, the jointer, band saw, electric arc welder, and acetylene welding apparatus.

Lines painted on the floor around dangerous machines and equipment to indicate danger zones may prove helpful. Some instructors place a railing around the area where power machines are grouped in order to prevent pupils, other than the operator, from standing near them. Aisles should be provided for pupils to follow when they go to and from different parts of the shop room or building, and should be located so that those walking in them do not come into danger zones. The teacher should enforce certain definite traffic regulations within the shop. Controlled shop traffic, as well as good conduct, is an excellent aid in the prevention of accidents.

The extent to which poor illumination may be the cause of accidents in school shops is not definitely known, but it is reasonable to assume that proper illumination is as essential to the prevention of accidents in school shops as it is to the prevention of accidents in industrial shops. The problem of providing proper illumination

in a school shop is one for an illumination engineer. Expert advice is not always sought or followed when new buildings are erected and as a result there are many very poorly lighted shops.

When old classrooms are converted into shops, care should be taken to provide adequate light. Natural light usually is preferred to artificial light, but in the case of shops which are located in dark basement rooms, it is impossible to provide enough natural light. In such a case where there is not sufficient natural light, provision should be made for sufficient artificial light to bring the illumination to all parts of the shop up to a minimum of at least fifteen to twenty foot candles. Individual lights with a proper shade on them should be placed on all machines which require special illumination at the point-of-operation.

Floor covering should be placed on shop floors to minimize the chance of slipping. This is especially true around dangerous machines such as the jointer and table saw. It is a good practice to place corrugated rubber matting over the operator's territory for extra protection.

Provision should be made for locking off all electric power in the shop. If it is not possible to have a central switch panel of modern, approved design, each individual machine should be provided with a switch that can be locked. All switches on machines should be well enclosed and positive in action. Most modern machines are equipped with an excellent type of circuit-breaker switch located on the machine in a position near the operator. Accidents may often be prevented if it is possible to turn the power off quickly.

Many injuries to shop students can be traced to faulty hand tools. Dull saws, "mushroomed" chisels, hammers with loose handles and "mushroomed" or damaged faces, broken saw horses and stepladders, and vises that do not hold are some of the things that are dangerous. Most hand tools are inexpensive to replace, and many can be repaired by students or teacher.

Safety Practices

There are many safety practices which are commonly used in school shops that serve to eliminate the chance for injury. Some of these practices which were arrived at by means of a survey are summarized below. They represent practices which are actually used with good results and deserve careful consideration.

1. Before machines are put in operation in a school shop, the instructor should list definitely the things he expects to teach through the use of the machine. This list should be printed on a cardboard and fastened to the machine. The student should be taught how to perform these particular operations which he is expected to learn. Students should not be allowed to perform operations not printed on the card.

2. All machines which are used in school shops should be carefully checked by a competent person before pupils are permitted to use them. Regular checking should be made under the direction of the instructor. Outside agencies may render valuable service through a complete check of shop equipment.

3. Safety instructions should be

worked out in great detail and put in writing. These instructions should be clearly stated and contain specific information that the pupil needs to know.

4. In addition to receiving written instruction on the care and operation of machines, pupils should be given a demonstration of the operations which they are expected to perform. The demonstration should be supplemented with complete oral instructions. Pupils should be given an opportunity to ask questions and receive instructions regarding any operation which they do not clearly understand.

5. Some plan for ascertaining the degree and extent of the pupil's knowledge of the correct operation of machines should be followed. The written test has been extensively used and is generally approved. Any pupil who is not 100 per cent informed regarding the operations to be performed is not adequately protected.

6. Visual aids in the teaching of safety are extensively used in industry. They are used less extensively in the public school shops. These aids are valuable teaching devices and appear in numerous forms, as picture slides, motion pictures, photographs, cartoons, posters, verses and slogans, and news bulletins. Their cost, in most cases, is reasonable. An enterprising teacher who can catch the imagination of his students will be able to promote much interest in safety education through visual aids.

7. Parents should be informed regarding the school activities of their children. They should be asked to coöperate in providing safe working conditions in the school shop. Parents' permits serve to call attention to the importance of safety.

8. Safety pledges, safety certificates, and student proficiency cards serve to call the attention of pupils to the importance and necessity of careful conduct. Many pupils take great pride in holding a certificate or a card of the type mentioned. This fact serves to increase the interest in safety habits.

9. A careful study of accurate and complete shop accident records will reveal many suggestions for the improvement of the safety program. These records call attention to the mistakes which have been made and the penalty which one must pay.

10. A complete and detailed record of shop accidents is a protection to the teacher and to the school in the event legal action is taken against them.

11. Physical examinations of pupils is not a common practice but a very desirable one, since the physical and mental condition of pupils may affect the chance of injury.

12. Loose clothing may very easily be caught in moving parts of machines, and creates unnecessary hazards. Proper types of shop clothing or uniforms will overcome many of these hazards.

13. Emergency first-aid supplies are provided in most schools. This practice is for the benefit of the injured student who needs immediate treatment and is not intended to take the place of the physician, but to supplement his services.

14. The imposition of penalties on pupils who do not use machines properly is resorted to in a few shops. Some forms of penalties may be very effective, but the use of penalties

which deprive the pupil of the use of machines interferes with instruction.

15. Constant and continuous supervision of all shop activities is one of the most important duties of the shop teacher, especially from the standpoint of safety. In the event that it is necessary for the instructor to be absent from the shop, he should have some means of locking off the power to all machines and should have well-trained and trustworthy assistants to leave in charge.

16. Proper conditions and safety practices in the shop establish a habit of critical thought and attitude toward conditions of safety outside of school as well as in the shop.

Financial Protection or Compensation

Protection as used here deals with recovery or compensation which may be allowed a student on account of an injury. In order to determine the extent and character of such protection, it is necessary to refer to statutory and judicial law. Cases of this nature have been decided in the superior courts of only a few states; however, the reasoning of the courts in these few cases may have wide application.

In some states the courts have ruled that pupils injured in public school shops cannot recover for injuries, because the school district or corporation is a branch, or agent of the state, engaged in a governmental function. In the absence of a statute to the contrary, the school is not responsible for its torts to any greater extent than the sovereign state. This rule of nonliability exists even though the school, its officers, or employees are negligent in providing safe working conditions. Jurists have said that this rule of nonliability prevails as a general rule in most of the states.

In California, the state statute provides that a pupil may recover damages for his injury sustained from work in a school shop, if it is caused by the negligence of the school district, its officers, or employees. The statutory law of California, as well as the reasoning of its superior courts, deserve a great deal of consideration. While some provisions are made in a few other states, either by statutory law or by court precedent, to compensate injured students, none has gone so far in providing financial protection or compensation as the State of California.

It seems highly desirable that some kind of compensation be provided to remunerate pupils for injuries sustained in connection with school work, where the injury was caused by the negligence of the school, its officers, or employees. Such protection would surely have a desirable effect on accident prevention and stimulate schools to make adequate safety provision and use effective safety practices. There is some justification for the proposal that the public school be made liable by law for the protection of school pupils to the same extent that private industry is responsible for injuries sustained by its employees.

STATE SUPERVISION OF INDUSTRIAL ARTS

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Mr. Fales, because of a long and successful experience as a state supervisor of industrial arts is exceptionally well qualified to write on this subject. This article is rich in helpful, practical material for the supervisor and administrator.

EDUCATION is a state function. As such, the state should appoint officers to guide, assist and advise local authorities and teachers. These officers should be charged with the responsibility for the reasonable growth and development of their own phase of education. Industrial arts is no exception to this policy.

It is a new and developing phase of education usually organized under the direction of a principal who has been trained for academic work. Many of these men know very little about industry and its work. A state supervisor of industrial arts work is needed in every state where industrial arts is taught if it is to develop in a sound and economical manner.

Present Status

There are at present at least two states employing full-time supervisors of industrial arts. They are New Jersey and New York. Connecticut has delegated some supervisory responsibility to a teachers college man. Pennsylvania, like many other states, delegates some authority for the administration and supervision of industrial arts work to vocational supervisors. Massachusetts, Maine, Texas and several other states have considered the appointment of a full-time supervisor but have not yet done so.

The demand for state supervision is growing. It is stimulated in part by teachers who feel the need of a policy formulating and coördinating officer and in part by superintendents and principals, most of whom have had little or no preparation in industrial arts work. They appreciate the services of a consulting expert in this area of education.

Supervision in New Jersey

This state has long shown the beneficial effect of state supervision. The long and continuous attention of capable supervisors has brought about the development of a very fine type of industrial arts work. The supervisor, as a consultant, visits the various industrial arts centers frequently, inspecting, supervising and suggesting ways and means for improvement.

Probably the most effective single supervisory procedure developed in New Jersey is the offering of shop courses taught by the State Supervisor. The state is small thus making it possible to organize classes for teachers in various communities. Such classes may study new processes and types of work. In-service teacher training of this type is most effective.

Supervision in New York State

In New York State a program of industrial arts education has been established which harmonizes with the objectives commonly defined by general educators for each period of child life, or school age, as the case may be.

In the elementary school the program calls for those types of construction work which have to do with food, shelter, clothing, tools and materials, utensils, records, communication and transportation. Simple articles are constructed by the children when and if the making of them will further and enrich their understandings of their environment and the material heritage. Such things as soap, paper, ink, clothes, model trains, boats, etc. may be constructed when they will further educational purposes. The actual construction is initiated only when the classroom teacher is able to improve the learning situation thereby. Special teachers are not usually employed for this work, except for consultation purposes.

In the secondary school a general education and exploratory program of experience and study is conducted as a part of the general curriculum. Inasmuch as the work is not vocational (trade preparatory) the courses offered are general, meaning that they provide opportunity to do several kinds of work in one medium.

The state program calls for offering in each industrial arts department study and experience in the following areas of industry: textiles, woodwork, metalwork of all types, printing, electricity, ceramics. Such courses are exceedingly rich and offer opportunities for many varied experiences. Sequences of woodwork 1, 2, 3 and 4 are not offered. Such sequences are offered in vocational schools where trade teachers and equipment are available. The effect of this policy has been marked. During the last seven years the number of school districts offering industrial arts has doubled. The industrial arts enrollment in the schools where shop work was previously taught has risen rapidly; in some cases it has doubled. While the breadth of work offered may not be the sole cause of the tremendous expansion, unquestionably the clearer definition of the goals and the means of attainment have brought favorable response. New York has not permanently lost a single department throughout the depression. Six departments were closed for a short time but all have been reopened. In no case has any federal or state aid ever been used to promote this type of work.

The Nature of State Supervision

State supervision differs from local supervision in many respects. Local supervisors look to state supervisors for leadership, definition of policies, evaluation and suggestions. The bulk of the state work does not deal with the detail of local supervision although it overlaps it in many respects.

Local supervision in addition to interpreting state procedures and policies deals with the administration of local departments. Supplies and tools must be purchased or at least requisitioned, teachers must be assigned, schedules must be developed and considerable detail routine work must be performed.

Some of the differences in the two types of supervision are shown in the following table:

State Supervisory Work is Varied

The work of the state supervisor varies widely from month to month and from year to year. In times of depression he must aid in protection and defense of the work. In times of good business and easy money he must be prepared to aid in the direct-

STATE AND LOCAL SUPERVISORY FUNCTIONS

Administrative Functions	*Local*	*State*
Budgets	Formulate	Occasional consultation
Departmental expansion	Necessary	Necessary
Employment of teachers	Customary	Occasional advice
Publicity	Very desirable	Infrequent
Office routine	Necessary	Necessary
Policy formation	Local only	State and local
Pupil Schedules	Frequent	Never
Records and reports	Responsible	Advisory only
Supplies and equipment	Responsible	Advisory only
Teacher schedule and assignment	Responsible	Advisory only
Supervisory Functions	*Local*	*State*
Courses of study	Formulate	Organize State Approve locals
Inspection of teaching	Necessary	Frequent
Rating teachers	Necessary	Seldom
Records	Desirable	Necessary
Professional relations	Local	Local and state
Organization of state conferences	As speakers mostly	Direction and Organization
Professional improvement of teachers	Local advisory	State and local advisory
Pupil guidance	Constant	Never
Surveys	Never	Frequent
New departments (develop)	Seldom	Frequent
State policies (organization)	Advisory	Constant
Teacher education (coöperate with teachers colleges)	Desirable	Constant

ing of new developments in a manner which will not bring repercussions.

His work is seasonable. In the fall he must help new departments get under way. In the winter he must aid in the evaluation of the work of departments where changes may be made. He also is expected to be able to advise regarding the merits of experienced teachers. In the spring he helps plan new shops and equipment lists. By late spring there is an accumulation of routine work which may last far into the summer before it is all cleaned up. In the summer he edits courses and prepares new bulletins.

He travels about half of the year and always has a long list of places where supervisory visits have been requested. Conferences are frequent occurrences at all times of the year. Speaking engagements are numerous and individuals are always needing assistance.

Courses of study organized locally are submitted for approval. These must be reviewed carefully. Letters of suggestions must be prepared. Shop plans must be examined and sometimes revised for safety. These matters require extensive correspondence.

Industrial Arts Supervisor and General Education

Insofar as possible the industrial arts supervisor should coöperate with those who control the general pro-

gram. School programs, schedules and time allotments may be developed with their coöperation and support. Industrial arts being a part of general education, general educators should take into account the suggestions of the specialists in the various practical arts fields. General educators define the guiding policies and state the requirements for diplomas. Industrial arts supervisors must be cognizant of the special and general features of the general program and help to make a place for industrial arts in the total program.

The state supervisor must of necessity furnish the leadership if a program is to be developed. To do this he must formulate his philosophy of industrial arts and convince the people with whom he is working that it is correct. Starting with a knowledge of children, the learning process, society today and the school objectives, he should develop an outline of a body of content which will fulfill the objectives. Once the range of content is defined in harmony with the objectives he must begin to propose the content and assist individuals to develop the necessary teaching techniques to achieve the stated ends. First with individuals, then with groups and finally with the entire state, he must encourage, assist, suggest and praise success. As the new techniques are understood, they will be developed.

Industrial Arts and Vocational Education

Industrial arts work is that form of education having to do with the study of industry through manipulative and constructive shop work of interest to school pupils. It is general education for all boys and girls.

Vocational education is preparation for gainful employment for the selected few pupils who through industrial arts exploratory work have discovered that they wish to prepare themselves to work at some industrial trade or occupation. Industrial arts is for all and vocational education is for the selected few of proven ability.

If these policies are accepted the functions are clear. With policies clear and well defined, there can be no friction between these two groups of educators. The two types of work may overlap at times in small schools but one should never try to absorb or imitate the other. Such procedure is disastrous.

Concessions are necessary to the other type of work only when both are taught in the same shop by the same instructor during the same day. In this case one or the other suffers inevitably.

If these two types of work are to be properly related, it will be necessary for industrial arts and vocational supervisors to coöperate. In both types of work, tools, subject-matter content, machines, work performed, personnel training and interests are all similar. Vocational education is advanced study of industry without the same extensive emphasis upon the general aspects of industry. Good vocational education is dependent upon good industrial arts.

Relationship to the Community

Not being a resident of the communities in which he works, the state supervisor has only slight contact with them. He is employed by the state to assist local authorities to develop the best possible kind of industrial

arts work. He does not usually work with the individual members of the community except with the approval of the school authorities.

He must study the community, its work, comparative wealth, occupational opportunity and school facilities. All of these have a part in his community survey, which contributes to his recommendations. But even these features lose some of their significance as the automobile, train, airplane and radio decrease the size of our world. It is the function of industrial arts to prepare pupils to live in an industrialized society.

Relationship to Board of Education

The board of education is composed of the people's chosen representatives. As such they should not be approached except through their duly appointed officer, the superintendent. Upon his request, the supervisor should hold himself in readiness to meet with the board to develop new programs for them or explain his recommendations. They should never be approached otherwise.

Relationship to Superintendents

As the highest authority in the local community excepting the board of education, when making a supervisory call, the supervisor should see the superintendent first and last. The entire local case must be made clear to him, and for purposes of record the supervisor's recommendations should be made in writing to avoid misunderstanding.

Relationship to Principals

Principals are in charge of their own buildings. Supervisors upon entering a building should first go directly to the office and make their presence known. Usually the supervisor is conducted to the industrial arts shop where he may or may not be left to formulate his own opinions. After observing and discussing the situation with the instructor he should return to the office and report on his findings and conclusions. Care should be taken to make only constructive criticism. Teachers should be supported and defended as much as possible. It is usually better to help the employed teacher to make adjustments than it is to break in a new teacher and then perhaps find that he is not doing any better than the old teacher.

Principals usually have been trained academically. Consequently they welcome the assistance and advice of the state industrial arts supervisor.

Care should be taken to explain to the principal most of the industrial arts policies which apply to school and shop organization. A sympathetic principal who understands standards and practices in industrial arts shops can be of great assistance to the teacher. His daily contacts with the teacher and the opportunity which he has of observing practice frequently makes him a most necessary adjunct to a successful industrial arts program.

Relationship to the Local Supervisor

The local supervisor usually has the detailed matters of administration well in hand. In exceptional cases he may be found lax in inventories, requisitioning, and housekeeping. This, however, can usually be corrected easily.

The greatest and most common difficulty is found when the local supervisor does not understand the philosophy of industrial arts work. In such

cases the quality of the work does not rise above his standards and vision. Cases of this kind make necessary statewide and individual conferences to educate the local leaders. When the industrial arts point of view is accepted, supervisors should be urged to hold local staff conferences for in-service and upgrading purposes. These eventually bring splendid teacher growth.

Relationship to Teachers in Small Communities

In all states the bulk of the teachers are graduates of industrial arts or vocational teacher preparatory courses. Only a few of the teacher preparatory schools and colleges have developed the full industrial arts concept. This is largely due to the fact that the staff members have not been able to study, travel and observe the best work in the country.

Teachers of industrial arts tend to allow pupils to "make" projects without giving much real attention to the general education content. They teach only the necessary information.

To make them cognizant of the new techniques, the general education content, and problem solving opportunities, some means of education must be found. Many states, even though they have no state leaders, are meeting this need through club work.

Local or regional industrial arts teachers' clubs are being formed in large numbers. Here local jealousies are broken down, new ideas are spread, and industrial arts interests may be developed. The state officer who encourages these clubs does much to further the effective education of the teachers.

Industrial arts teachers, particularly in the small towns, should be organized into groups coördinated by a state leadership group of their own choosing. This body should eventually be able to assume some authority in the organization of state courses and research projects. They should also be able to make proposals and suggestions to state authorities in the development of teacher education. Such a body can be most effective in improving the character and functioning of industrial arts work in the public schools of any state.

In the state of New York such a body meets semi-annually to discuss matters of importance to all. This group is called the Industrial Arts Steering Committee. It is pioneering in statewide organization of industrial arts teachers. It should become a strong professional leadership group.

Relationship to Teachers Colleges

Unless the state education department is so completely centralized that state authorities have entire control of the teacher training work, state supervisors have little opportunity to affect the nature of the teacher preparation except through certification and influence. Certification is a remote control for it does not affect classroom procedure directly nor does it define practice or philosophy.

Supervisors can, however, suggest places where the best teaching is being done as prospective schools for educating cadet teachers. By molding the minds of the practice teacher with the best public school practice in the state he is able to exercise indirectly a wholesome effect upon the experienced teacher.

Indirectly the supervisor's require-

ments and requests in the field may have a very beneficial effect. Teachers return to summer school for in-service training and ask for certain things. The teacher education staffs endeavor to provide that which their students need and thus state policies may be made effective.

Supervision, Inspection and Surveys

The state supervisor acts in the capacity of a doctor diagnosing, prescribing and ultimately checking up to determine how effective his suggestions have been. The measure of a supervisor's work may be found in the amount of improvement which takes place in the industrial arts shops of the state.

All supervision is dependent upon an understanding of the problems. State supervisors not being familiar with local conditions must first study the situation. This study of the conditions amounts to an inspection. It should never be made for the purpose of detecting irregularities but only to locate the weaknesses and the strong points of the case. All of these judgments must be compared with a standard which of course is nothing other than the concept of perfection which is held by the supervisor. Having discovered the strengths of the teacher and his work, they should be emphasized for the purpose of offsetting any necessary adverse criticisms, real or implied. When weaknesses are discovered the supervisor must always be ready with a solution or constructive suggestion which will leave the teacher with the thought that he has been helped. Unless constructive suggestions can be made, difficulties might well be overlooked. Observations and recommendations should always be discussed frankly with the teachers before leaving the school.

State supervisors are called upon to evaluate the work of the teacher in the small school, in the small village, or of a given teacher in the largest school in the largest city. Fundamentally they are all alike. All shop rooms contain a teacher, pupils, equipment and supplies. The same fundamental educational policies and subject matter should be common to all departments. Methods of attainment may vary but the goals never.

Surveys involve a careful study of a community, many shops, schools, teachers, courses, children and industries. After the community survey is completed and a general pattern established for the entire department, shops and teachers can be studied individually, for all school systems are composed of individual teachers and shops, even in the large cities. Sometimes the individual school, because of its large size, may be used as the basic unit.

Recommendations for such surveys in large cities are sometimes set up for each school, supplemented with general recommendations for all schools. Recommendations are the constructive suggestions which should improve the particular system being studied.

The Supervisor and Research

Studies of various kinds should be in process continually. Information is needed regarding pupil enrolment, teaching load, types of work taught, occupational statistics and many other things. Methods should be tried, tested and improved. Subject matter content should be compiled and prepared for use in the classrooms and shops.

Research workers or at least clerks and stenographers should be available to facilitate constructive work as well as evaluation of present practice. Up to the present time such service has not been adequately provided for supervisors of industrial arts in any of the state offices.

Publications

State bulletins should be organized and developed under the direction of the supervisor. For some time to come each state will continue to develop and follow a philosophy of its own. Some one person must guide this movement. The supervisor should do this.

Another bulletin should contain regulations pertaining to credit, course organization, sequences, kinds of shops, time allotment, shop plans, equipment lists, teacher certification. Such material may be prepared by local teachers or supervisors but in the last analysis the state supervisor of industrial arts must approve this material.

Conferences

State and local conferences form no small part of the supervisor's work. He must assist in local programs, and call some meetings to accomplish his own ends.

Regional conferences in which the philosophy and policies of the state are presented to teachers and administrators always help to establish a more complete understanding. Only in this way can a supervisor in a large state meet the authorities and teachers. Only through this personal contact can satisfactory coöperation be developed.

THEY ARE DIFFERENT

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Dr. Fryklund makes very definite and clear the distinction between industrial arts and vocational-industrial education. This distinction is important and still is not fully appreciated by many educators.

INDUSTRIAL Arts Education and Trade Education are assumed by many educators and by many people outside the schools to be alike. Little or no distinction is made between them. Both these branches of education have their similarities and they have their differences. They are similar because they serve the community by providing education that is representative of industry. They are different because they provide this education each with quite different ends in view. They are frequently brought together in joint reference as "industrial education."

In the lower grades and through the years in high school and in college, students in industrial education, whether in industrial arts or in trade education, deal with materials. In the lower grades the materials are simple, easily worked, and in keeping with the limited potentialities of the learners. At the lower levels of schooling in industrial education, in-

dustrial arts only is possible of achievement and advisable as an offering. Trade education has no place at the lower level. Advancing into the upper levels of schooling, the materials become more difficult to work and the potentialities of the learners broaden. The materials are in keeping with the maturity of those who work them. Somewhere in the upper levels, industrial arts education becomes related to trade education with respect to materials and to processes, but they remain different in aims.

Trade education serves older and more select groups. It is exacting in development of hand skills and in the acquisition of technical knowledges. Industrial arts education serves all ages and selectivity is not of concern. It is assumed not to be as exacting as is trade education in development of skills. Trade education is specific vocational preparation for employment upon graduation. Industrial arts education is offered for general educational purposes. It is recognized today that general academic education alone is not sufficient to provide youth with broad understandings, appreciations, and interpretations of world opportunities and needs. Industrial arts, with other of the non-academic offerings, make strong contributions to the whole education pattern. They offer experiences that make for enlargement of the educational offering.

A study of aims of these two branches of education should be helpful. One set is for general woodworking in the junior high school. The other set is for patternmaking in the trade and technical school. Both of these sets of aims were conceived from, and in harmony with, well-known aims of general education. Both branches of industrial education, as all other educational offerings, are integral parts of all education. Therefore, any aims conceived for any phase of both branches should be in harmony with aims of general education. The aims here presented are chosen because of the similarity of the materials involved. They are among several sets of aims for various offerings in industrial arts and trade education in the Detroit schools. All such aims in Detroit were conceived from and in harmony with aims of general education. Lack of space limits lengthy interpretations of these two sets of aims in this paper. They are likely to be understood without amplification.

Aims of General Woodworking in the Intermediate Schools

1. To inculcate ideals and attitudes of readiness to assist and to cooperate with others in the group activities of woodworking.

2. To develop habits of cheerful, orderly, and methodical performance of the various tasks involved in woodworking.

3. To develop interest in and understanding of the sources, characteristics, values and uses of the materials involved in general woodworking.

4. To develop the desire and the ability to select wisely, care for, and use properly, products of the woodworking industries.

5. To develop habits of doing things properly in the interests of safety and hygiene for one's self and for others.

6. To foster appreciation of good workmanship, good design, good materials, and good structure in creative experiences in woodworking.

7. To develop the habit of using simple drawings and diagrams in planning construction in wood.

8. To provide opportunities for developing independence in planning wisely and following through to successful completion, individual and group projects.

9. To provide information and experiences that would awaken interest in and create intelligent understanding of occupations related to the woodworking industry.

10. To encourage development of hobby interests in woodworking.

11. To offer an opportunity to study technological developments in the woodworking industries and their contributions to society.

Aims of Patternmaking in Technical and Trade Schools

1. To develop skill in the use of patternmaking tools and machines in the construction of wood patterns.

2. To develop interests in and understanding of the materials involved in patternmaking, their sources, characteristics, values, and uses.

3. To foster appreciation of good workmanship, good design, and good structure in making wood patterns.

4. To develop habits of doing things properly in the patternmaking shop in the interests of safety and hygiene for one's self and for others.

5. To provide opportunities for developing independence in wise planning, and in making layouts on wood, and following through to successful completion individual and group projects in patternmaking.

6. To inculcate ideals and attitudes of readiness to assist and to cooperate with others.

7. To develop habits of cheerful, orderly, and methodical performances of the various tasks involved in patternmaking.

8. To provide experiences that would create intelligent understanding of occupations related directly to patternmaking.

9. To learn to read drawings for use in planning and in construction.

The woodworking is an industrial arts offering. The patternmaking is a trade offering. One of the major differences between them is in the emphasis on skill. It will be observed that the term skill does not appear in the aims for industrial arts woodworking, but it appears in the first aim for trade patternmaking. In the former, skill would be developed in the natural turn of things, and according to individual differences. There is no pressure and planned drill to develop high degrees of manipulative skill. There are other and, perhaps, more important aims, but of course skill should not be ignored. Some learners in industrial arts education can develop skill and it should be encouraged, but because the classes are not composed of select groups, there will be many who would profit most by the intent of the other aims.

In examining the aims of woodworking, it is evident that development of skill is secondary. Ideals, attitudes, appreciations, and understandings predominate. Expressions represented in these aims, and not unlike those of other branches of education, are: *coöperation, readiness, consumer values, how to think, safety education, methodical procedure, persistence, guidance, leisure time,* and *contributions of science.* Analysis of these aims reveals that industrial arts

has many values of general nature, and that there is little to suggest strictly vocational ends. In the junior and senior years of high school, the industrial arts offerings should be intensive and thorough enough to develop salable vocational abilities for those who can and will take advantage of them. Youth today who leave school at the end of high school have little chance in the world with only an academic education to offer. A strong industrial arts program can insure youth against the future.

Examination of the aims for patternmaking shows that development of skill is important, hence its mention in the first aim. However, modern trade education also is concerned with development of ideals, attitudes, appreciations, and understandings that are not remotely related to other educational values. The modern trade school has many offerings aside from the strictly skill subjects. The modern trade school is a technical school having academic departments, music, art, physical education, wherein is fostered development of a well balanced individual who possesses trade skill. The aims here presented for patternmaking are suggestive of broad educational values as well as the narrower manipulative skills. In trade education today, as indicated by these aims, common expressions are *skill, coöperation, readiness, knowledge of materials, safety education, methodical procedure, how to think, persistence, contributions of science,* and *guidance.* A decade ago, a set of aims for trade education as broad as those here presented would not have been acceptable. There are those in trade education today who would agree that there is a change from a narrow skill concept to a broad concept such as indicated by the aims here presented. Education today is not just selfish preparation. Education today is for community participation and community living. And trade education has an exceedingly important place in this perspective.

Industrial arts education involves shop activities that are samplings of crafts that can usually be offered in the day schools and in all grades. The materials are many. Common among them are paper, wood, metal, plastics, and ceramics. The content of courses and the methods of teaching are in keeping with aims quite similar to those presented here. The money expended is usually made available through the usual budgetary procedures as is the money for other educational offerings.

Trade education involves shop activities that are usually offered in special trade departments of high schools, technical schools and in trade schools. The money expended usually is made available through joint budgetary procedures of the state, local and federal government. The federal vocational laws make funds available provided the instruction covers a bona fide trade offering. The detail of this is involved, and generally known by most educators, therefore further reference can well be left for other reading.

Trade education and need for it is growing despite the writings of popular authors who, without supporting facts, say that the machine has displaced the skilled trade. On the contrary, the machine has created hundreds of new skilled trades. Even

though massed production methods have expanded, results of a study made by the writer for the Employment Stabilization Research Institute of Minneapolis in 1933, show that 43% of the workers in 66 different industries required vocational training of from six months to seven years in order to qualify for their jobs. The leisure time fallacy which is so frequently expounded as the ultimate in modern education is without logical support if one looks about in the modern industrial world. The modern worker is kept busy in much of his leisure time keeping up with the demands of his job if he has a job of any consequence. He is improving his work qualifications. All people in the world who have work of consequence must continuously study in order to keep up with technological change. Education must be continuous if personal usefulness is to be continuous.

Industrial Arts Education in the junior high school levels, and lower, are quite different from Trade Education. Advancing into the junior and senior years, and college, they become more alike. Much can be said in claims of unlikeness and likeness but a reliable way to compare them is to examine their aims and to visit shops, giving time enough to make a thorough study.

WHAT DO THEY SEE?

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Dr. Noall writes here out of a rich experience as a teacher of teachers and as a successful city supervisor of industrial education. This might well be regarded as a description of what goes on in the mind of a supervisor as he goes about his daily work.

WHEN they visit my shop, what do they see? Some people have eyes and yet they see not just as some of our students have ears and, we all know, they "hear not." A teacher of industrial arts may not assume that his principal, his supervisor, his superintendent, or even one of the many parents or other casual visitors to his shop is either blind or lacking in understanding. Then if the visitor does understand and if he does see, what does he see and what is his evaluation of what he sees?

Some people judge by first impressions. They believe that in that first flash of time when the mind is wide open to impressions and when there is no trace of prejudice or favor, the totality of the new situation is revealed to them as it cannot be at any other time. All that subsequent experience can do is to piece out that first impression, it may add a detail here, but it will reveal a defect there. One begins to weigh the elements and rationalize about their values, but he will hardly put them into the total picture without some measure of bias. To arrive unannounced and enter unobserved leaves those first few moments free for the first imprint of the situation.

When I visit a school shop, I see industry, housekeeping, organization; I see teaching materials, tools, and

machines; but, even more important, I feel the atmosphere—the evidences of morale — teacher-pupil relationships. interest, and enthusiasm. Sooner or later some one thing will absorb my attention and I become engrossed in classroom detail. The matter of student activity, or lack of it, is always interesting. Sometimes I find all students pursuing a rigid routine, and though they are active and attentive they lack enthusiasm and are not unhappy when the closing bell rings. In another shop I may find idleness or I stand on the sidelines of a wrestling match while the teacher is engaged with his star pupil oblivious to all that is going on. I have been in a shop as long as thirty minutes before my presence has been discovered. When this situation exists it may be taken as fair evidence that many other things pass unobserved. One teacher is so busy with the routine of his work and the incessant demands for his help that he has not a moment to visit with me. Another follows at my heels, quick to explain every defect he suspects I observe. "I've showed him how to plane twenty times," I am told. "How long must I keep it up?" he adds with a tinge of futility in his manner, for after all he does not select his pupils. He forgets that *where there is no learning there has been no teaching, but only trying,* and the boy's excuse is as good as his own. He lives so close to his job that he can neither see nor understand that the successful teacher proves *what can be done* while he, with his excuses, only proves what *he* cannot do.

It is refreshing to enter a class where all students are busily engaged and working intelligently at their tasks; where the instructor moves about quietly, alert to the evidence of his need, but unhurried because he has laid the foundation for the pupils' project activity in careful classroom teaching. As a rule, projects are varied and well designed and there is ample evidence about the room of student planning.

There are the rare visits that cling to one's memory like that of yesterday, when I dropped into what proved to be a "free activity hour." Students were permitted to choose a department and to work at any appropriate task that interested them. I found junior high students as thick as flies, — at least seventy of them, and all working with the greatest enthusiasm. It seemed unbelievable as I passed among them noting that a dozen or more types of work were in progress with not one student idle and hardly an instance of incorrect construction or tool technique. When I found the teacher standing off to one side, he seemed the least concerned of them all. Not a detail escaped his watchful eye; he never failed to be at the point of need, and still he had time to discuss with me the situation and its significance to the school. It is needless to add that the organization for handling tools and materials had been simplified and routinized so as to require the minimum of his time and attention.

Naturally, I am interested in this matter of tools and their use and care, for it has been often observed that students who learn to use tools well in the school shop continue to use them when not in school. I have few misgivings for the success of a teacher

if I find his students following correct procedures and showing care for the tools. Almost without exception the tools will be in good condition, properly arranged, and carefully accounted for. It is noteworthy that this attitude and habit of careful use and accounting for tools seldom fails to win a word of praise from the visitor.

It is more common to find the tools dull, tool marks on the bench and an attitude of indifference among the students. Everybody wants the one sharp saw, the one good wrench, or the one new file. The tool room is a masterpiece of disorder with equipment scattered about and no evidence of either planning or supervision, the chief article of furniture being the junk box which students use freely when tools are broken and even when they become too dull for use.

Care of tools, pride in workmanship, and safe procedures usually go hand in hand, for all are outcomes of the same careful teaching and supervised shop practice. However, I cannot take too much for granted. I want to know more about the teaching of safety, for accidents do happen and a teacher cannot afford to be a party to a lost finger or to the impairment of a student's vision. I note the condition of tools and equipment, the mushroomed chisels, the chipped hammer faces, the unguarded grinders, belts, and cutting machines. I may find bare electric wires and open switches so located that students may easily make contacts with radiation or other plumbing equipment. Worn wrenches and broken handles may also provide occasion for injury. I also observe the students at work and I ask them searching questions in which they make a good accounting, but as a curious visitor I am still not satisfied. I go to the teacher and if he has done his work well he will show me his plan for covering every important aspect of safety teaching including his file of examinations which give evidence of the students' understanding of safety. He will point out the student's affidavit that he has had safe procedures carefully demonstrated to him by the teacher. This file is one of the efficient teacher's prized possessions.

Second only to the care of tools in the process of good housekeeping is the organization for the handling of supplies. Whether from unwise school board policies, lack of facilities, or from personal disposition, some teachers choose for their part the rôle of second-class stock clerks and are always engrossed in details of minor importance. When the visitor finds this situation, he is not surprised to find numerous matters of educational significance ignored. Students hurry out after class leaving tools about and their benches covered with litter. There is also the likelihood that projects will be scattered round and that one will hear frequent complaints of losses or injury to stock.

I have found many industrial arts teachers assigned to situations in which it was next to impossible for them to do satisfactory work. The room is small, the equipment is poor, and if there is a tool or supply room it is small and inadequate; no budget allowance is made for teaching materials, so the teacher must buy supplies in his own name and pray earnestly to get out in the spring without a defi-

cit, or without an inventory if he fails to get a contract. To play safe, he may sell at a safe margin and risk his reputation when a parent or a local board member accuses him of profiteering on the students. Such schools get a new teacher every year and the community wonders why industrial arts is not more popular.

The former teacher moves on with the consciousness of failure and I find him next year making another more or less futile battle with the elements. If he has capacity and is well trained, he will learn to master the "impossible" elements which at first engulfed him. He will find that through student organization and delegated authority he can account for his tools, and his supplies. He will find that boys like responsibility and will care for the routine of daily housekeeping, so that each new group of students may enter the department and find it clean and inviting. His reference shelf may be transformed from confusion to order and its use greatly increased when he learns to harness the energy of his students.

As a visitor to the industrial arts classes, I want to know what is happening to the boys. Are they learning to see the world around them? Are they acquiring a kinship with adult workers, based upon experience with the same tools, materials, and jobs? Are they learning to value tools for their purpose and appreciate materials for their use? Are students finding use for the economic geography they may have studied when they need supplies for the department or for home use? Do parents comment on the many new tasks their boys do round the house since they took shop under Mr. X? May I see evidences of physics, general science, or mathematics in the work in the shop, or, just as good, do I find shop experiences enriching the work of students in other departments of the school? The content of shop teaching is the finest kind of material for good English composition.

In some schools, the teacher is the only source of information and student learning is limited to what the teacher knows and can impart to individuals or groups. In better departments there is a textbook which all must read and account for. The school one likes to visit may have a text, but it also has a reference shelf of well-chosen books and at least one appropriate magazine. The amount of time devoted to class instruction may vary, but the work of students must show that it is adequate for group needs. The individual needs are met by ready recourse to any or all of a dozen other sources, only one of which is the teacher. This willing and capable use of many sources of information including outside reading and observation is one of the major clues to a good department.

We hear much these days about training for character and citizenship. I have had my first impression; I have inspected the housekeeping and tested the evidence of group and individual teaching; the safety training is satisfactory and initiative in planning and execution is properly encouraged. There is evidence of cooperation with other school departments where theory is taught which may be applied in the shop. But how about citizenship and character training? What shall I look for and

what can I see that will tell this story?

As an advocate of industrial arts I have long claimed this field to be most fertile for culture and character values. Where may one better learn the law of cause and effect? What department better illustrates that achievement requires industry? Every day one finds occasion for coöperation. Neglect of shop routine by one results in loss of time or inconvenience for all. If one offends, everybody pays a natural consequence. Yet these things do not operate by themselves. They all require the master touch of the skillful teacher. So again I put my ear to the ground for evidences and find them not difficult to discern. They are present in the atmosphere, they are manifest in the industry shown by the pupils and in the respect and affection shown to the teacher. The relations between students tell of good will, common purpose, and coöperation; the housekeeping and accounting for tools and supplies give evidence of integrity and responsibility.

Truly the shop is the measure of the teacher. People who are accustomed to the slums make slums out of palaces and those who are accustomed to the good may make palaces out of hovels. It is not the room or the equipment, or the boys that make the successful department. These are only aids, for the master teacher in this as in other fields can cultivate appreciations, develop character, impart knowledge, inspire interest and even train in useful skills in an attic or unused classroom and with improvised equipment.

The master teacher will give proportionately greater value when he is provided with a proper room, adequate tools and equipment, a budget for teaching materials, sufficient books and references, and a suitable time schedule, for he knows how to make the best use of all resources available to him.

The visitor may not appreciate all of the limitations under which the teacher labors; he may not possess the skills which are taught, and much of the knowledge imparted may be foreign to him, but if he knows his business as a school man or if, as a worthy patron, he has good judgment or keen discernment, the shop will be an open book from which he may read of the service given. The teacher who is worthy of his place will know "What they will see" and will be ready for them when they visit his shop.

TESTING THE RESULTS OF INDUSTRIAL ARTS INSTRUCTION

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Dr. Newkirk has made valuable contributions to the development of tests for use in industrial arts. His research and writing in this field are widely known. This contribution is of unusual interest and value.

INDUSTRIAL arts courses are considered a fundamental part of general education by all leading educators. A knowledge of the modern industrial world and the intelligent appreciation and use of its products is fundamental to intelligent living. The increased and fundamental contribution that industrial arts is making has also focused attention on teaching methods and refinements in the evaluation of the results of industrial arts instruction.

Many teachers of the industrial subjects still maintained that the very nature of their shop products discouraged the probability of the existence of any such unreliability in the evaluation of accomplishment as was found in the academic subjects. A few studies based on teachers' efforts to estimate the quality of tangible shop products soon made it apparent to the shop-teacher that this field was definitely no more immune to the influence of subjective factors than were the academic subjects. This experience tended to make many teachers definitely skeptical of all such subjective methods of measurement.

The rather recent development of general interest in the use of educational tests for guidance purposes is another factor which has attracted the attention of industrial arts teachers to the need for improving their measurement techniques. Every bonafide attempt to furnish accurate and objective educational guidance to pupils is accompanied by a real need for accurate measures of achievement in order to evaluate the efficiency of the guidance program. Thus, if measurement for guidance is to prosper, measurement of achievement must be improved.

Fundamentally, measurement in the industrial arts subjects is the same as measurement in any other educational field. The problems involve not the development of new principles of testing but rather the adaptation of well-recognized techniques to somewhat novel situations and subject matter. Thus, as a basis for understanding the meaning of measurement in this field an understanding of the meaning of measurement in general is essential.

Objective types of measuring instruments are of two general types: (1) achievement tests and scales, and (2) quality or rating scales. In general the former are designed for use in the classroom and are ordinarily placed in the hands of the individual pupil. If the items composing the tests have been carefully refined and evaluated so that each item bears a definite difficulty relationship to each

other item, the test may be said to have been scaled. Quality or rating scales are designed as land-marks or milestones to aid the teacher in recognizing given qualities. Such scales are usually not placed in the hands of the pupil but are used by the teacher for the purpose of assigning quality ratings to classroom or shop products prepared under definite directions and specifications.

Measurement in education may proceed along a number of different lines. For example, achievement tests are used for the purpose of evaluating the pupil's acquisition of educational experience. Such tests may be informal or they may be standardized, but if they measure the results of school training they are still achievement tests. Specialized types of achievement tests, known as diagnostic and analytical tests are designed to discover and reveal the exact identity of the individual pupil's strengths and weaknesses in the subject. The difficulty of making a sufficiently detailed analysis of the basic skills in the given field of instruction has discouraged the development of such diagnostic tests in many fields. Prognostic tests are designed to provide an accurate prediction of future achievement in specialized fields on the basis of present performance on certain basic but unlearned elements of the subject. Such tests have great possibilities for use in the industrial education subjects. Intelligence tests are intended to measure the underlying general capacity of the individual. They secure a cross-section of the power of the individual to learn or to adapt himself to new situations. Thus they are concerned with the unlearned skills, those aspects of the individual's abilities which are innate and are not dependent upon school training. A complete understanding of the meaning of measurements in industrial education involves some experience and contact with each of these foregoing types of tests. All are useful in some specific way in revealing a true picture of pupil accomplishment.

The day when the proponents of educational tests rally to their support with extravagant arguments and enthusiastic claims is past. Tests are coming to be clearly recognized for what they are: supervisory means to an instructional end. They are tools, not ends in themselves. They are so useful, and if used with a proper ballast of common-sense, so indispensable that extravagant claims are not required for their defense. Tests are valuable to industrial education teachers for the following:

1. The measurement of class and pupil achievement.
2. The establishment of standards and norms of performance.
3. The motivation of learning.
4. The determination of the efficiency of instruction.
5. The guidance and placement of pupils.
6. The evaluation of teaching materials and methods.

One of the more important developments in educational measurements in the past decade is the growth of the notion that more and more the classroom teacher must assume the responsibility for the use and interpretation of tests in each of their instructional fields. Not only has this resulted in the marked improvement and simplification of the testing instrument but

of greater importance, it has resulted in a marked improvement in the professional qualifications of teachers. Today the professionally-alive industrial arts teacher insists on having available diagnostic and analytical test materials for his classes. He does not sit idly by and wait for informal objective examinations to be transmitted to him by the central office or by his department head, but he leads the way by preparing his own objective exercises and submitting them to his fellow-teachers for criticism. He knows a good objective examination when he sees it. He understands the common criteria for the selection of a standardized test. He knows which standardized tests are useful and which are best adapted to his particular field.

There are several important qualities in a test which the industrial arts teacher should be able to recognize, whether he is engaged in evaluating commercial tests or whether he is merely interested in criticizing tests of his own construction. Validity, objectivity, and reliability are usually considered the major criteria for consideration in the evaluation of an objective examination of the informal type. Other supplementary criteria are useful when standardized tests are being considered.

The majority of modern commercial tests of the better quality provide data on most of the important qualities which should be considered in their selection. Tests for which honest and dependable affirmative answers are available for the following questions may in general be considered as suitable for use in the shop and drawing room.

1. Does this examination measure the particular abilities, skills, habits, informations which I have taught my class and which I have a right to expect them to know?

2. Does it sample widely enough into the various important phases of the subject to find out what the pupils actually know? How much time does it take to give the test? How many items does it include?

3. Are the exercises stated in straight-forward unambiguous form?

4. Are the exercises easily and accurately scored?

5. Are the directions to the students and the sample exercises clear and easily understood?

6. Has the test been used elsewhere or in previous classes? If so, in what kinds and sizes of schools?

7. If a standardized test, does it provide accurate and extensive norms and standards of useful types?

8. Are the directions and processes for the interpretation of the scores simple and clear?

9. Do the results point the way to possible means of correcting individual pupil difficulties?

10. Is the test reasonable in terms of time and cost per unit of valid and reliable information furnished by it?

Industrial arts teachers should carefully consider the measurable factors which are peculiar to the subject. A minimal list of fifteen such measurable factors which are clearly related to mastery in industrial arts education may be stated as follows:

1. Information—factual items important to the field.

2. Quality—evaluation of the product of tool, machine or instrument operations.

3. Technique—skill in manipula-

tion of tools, instruments or machines in the execution of a product.

4. Speed — rate of response in producing a project subject to commercial standards.

5. Reading of technical symbols —interpretation of working drawings, etc.

6. Reading—comprehension of instructions or related information from the printed page.

7. Spelling—ability to spell common words and necessary technical terms.

8. Mathematics — computational skills and mathematical concepts required in connection with shop work.

9. Appreciation of industrial products—recognition of merit and qualities of merit in products.

10. Planning — ability to develop suitable lay-out for doing a job.

11. Language—use of acceptable written and oral language forms.

12. Inventiveness — ingenuity in seeing new relationships and developing devices serviceable to society.

13. Personality—qualities usually recognized as essential to successful social and industrial adjustment.

14. Mechanical aptitude—natural aptitude for understanding mechanical devices and their operation.

15. Intelligence—power of the individual to learn and adjust himself to novel situations.

These factors are believed to represent the framework of measurement in the industrial arts subjects. Many of these qualities can be measured as separate phases of ability. Instruments for the measurement of a number of these factors are already available.

Four general classifications of tests are recognized as being of distinct value to the industrial education teacher. These cover the fields of (1) achievement, (2) aptitude, (3) intelligence, and (4) character-personality qualities. The achievement tests are of two types, the first dealing with the standardized and non-standardized industrial arts tests and trade tests, the second group dealing with general achievement tests in related subjects. These related subject-tests represent the major achievement fields of reading, spelling, language, writing, vocabulary, mathematics, and science. Each of these special fields leaves its mark on accomplishment in the industrial subjects.

The high pupil-mortality in many of our high school courses, and the other evidences of educational and vocational misfits all demand that the matter of the more accurate determination of individual pupil aptitudes be stressed. Industrial arts education teachers are so close to the problem that they can scarcely fail to be interested. Work in the industrial arts fields hinges to such a large extent upon the existence and utilization of mechanical abilities that the industrial arts education teacher will naturally turn to the mechanical-aptitude tests of which there are several very useful types. A knowledge of the uses of aptitude and prognostic tests, how to select them and interpret them, will do much to salvage a great deal of our current educational loss.

Information on the mental status of students of industrial arts represents most important supplementary information. Knowledge of the general mental ability of pupils does much to protect the teacher as well as the pupil from unfair demands and

criticisms. The individual of superior capacity may be expected to produce at a correspondingly superior level. Pupils of relatively inferior capacity can be recognized early enough to avoid unduly embarrassing them or making demands on them which they are incapable of meeting. The industrial arts teacher will find knowledge of the general mental ability of his pupils particularly useful in the interpretation of expected accomplishment.

Frequently one of the significant outcomes of industrial arts courses is the opportunity it affords for the development of character and personality. Many a misunderstood youngster, when observed in the light of his academic attainments, has revealed traits and abilities under the wise guidance of an understanding shop-teacher which have been hitherto unsuspected. It is only fair to recognize that after all abstract intelligence is only one phase of character and personality. There is a concrete aspect of it which is just as important. Causes of disciplinary disturbances are frequently removed when the mentally active but suppressed youngster is given an opportunity to express himself in some physical tangible form.

Teachers in all fields of subject matter are constantly struggling to improve the available methods of evaluating pupil-achievement. When the oral quiz was discarded in favor of the written examination a real advance in educational practice was made. The greatest improvement in the methods of classroom measurement came with the development of the objective informal test. Throughout this discussion it has been the purpose of the writer to emphasize the need for greater accuracy and reliability in the measurement of pupil achievements. The objective informal examination makes possible this type of accuracy for many classroom purposes. However, it is recognized that there are other important functions of the examination aside from the sheer cataloging of items of factual or informational importance. One of these is unquestionably provided by the carefully made essay or discussion-type examination through the opportunity it gives for the thoughtful organization of the larger units of the course. It is because of the importance of this function of the examination that objective informal tests may not be completely substituted for the essay-type examination. The compromise in which the emphasis is largely upon the acquisition and retention of facts. This will constitute from eighty to ninety per cent of the examination emphasis. For the balance of the time given to examinations, the discussion or organization type of test should probably be used.

The importance of the training in thought organization and expression which may come from examinations of this type is too great, however, to leave it to chance. There must be a real opportunity for the development of these desirable abilities. Accordingly, such organization-type examinations should be announced far in advance. The topics or questions to be discussed should be made available to the students as much as two or three weeks prior to the time when the papers are due. The pupils may be allowed to secure the necessary in-

formation relative to the topics from any authoritative source. The important thing to be considered here is that the topics be representative, that they place the emphasis on the important or major aspects of the subject, that the students have plenty of time in which to gather their information, organize it and prepare it in written form. In this way such an examination may be expected to really fulfill its function. Papers prepared under such circumstances are probably worthy of careful reading and evaluation. The worst feature of such a procedure is the fact that the papers must of necessity be evaluated on a subjective basis. Experience in this type of work has shown that the practice of reading and grading all discussions of a given topic in all of the papers before taking up a new topic will result in definitely improving the accuracy of the marks assigned.

The results from objective tests designed to sample frequently into many different areas of the course may be combined with such other grades or estimates as may be secured from tests of the organization type to constitute a very reliable measure of achievement. Such marks, derived largely from objective data, have the very important effect of protecting the pupil from unintentional injustice as well as of protecting the teacher himself from the accusation of personal prejudice. Both of these are important factors in the classroom measurement of achievement.

The rating of classroom and shop products is a phase of measurement of considerable importance in the industrial subjects. This arises, of course, from the fact that many of the results of instruction in these subjects are tangible products rather than items of information. The accurate evaluation of such results of classroom and shop instruction requires the use of many different kinds of rating scales for the evaluation of general merit. Certain qualities such as size, shape, technique in tool operation, color, design, and finish are quite definite, and in many respects may be evaluated quite objectively by the experienced shop teacher. The matter of securing reliability in the evaluation of certain of the more indefinite qualities of merit is not so simple, however.

Two factors operate to reduce the reliability of the ratings of shop products. The first of these involves the matter of securing typical and representative specimens of the work of the pupils for rating purposes. In order to secure such suitable specimens the conditions under which they are secured must be controlled. The directions and specifications to be followed in preparing the product must be clearly stated. The materials used by the pupils must be comparable. Tools must be standard, and equally sharp and well-adjusted. The shop teacher must carefully supervise the work during the preparation of such products to be used for measurement of comparative purposes to see that all conditions are properly controlled.

The second factor in the reliability of measurement of shop products by the rating process is the reliability of estimate of the teachers or judges themselves. Reasonably accuracy in the rating of shop products may be developed by most teachers after a short period of drill on the use of the

scales. The student or teacher should establish his own reliability of estimate on a scale before attempting to use for any serious purpose.

In a sense all measurement has as its primary motive the matter of adjustment. Guidance is adjustment. The diagnosis of individual pupil weaknesses and the use of remedial materials is adjustment. The classification and placement of pupils with groups likely to learn and to progress at about the same rates is adjustment. The sectioning of pupils into ability groups, the promotion and demotion of pupils is all a part of adjustment. The motivation of learning through the use of achievement testing may also be looked upon as a phase of adjustment. Thus it appears that the majority of the uses of test results are designed to improve the opportunities for learning, the conditions under which the pupil learns, and his relations to his fellow students.

THIS TALKING AGE*

ROBERT T. OLIVER
BUCKNELL UNIVERSITY

"ORATORY," said the wise old Roman Quintilian, some nineteen hundred years ago, "is the greatest gift of the gods to men."

He may have been prejudiced, for he earned his living — and a very good one, too—by teaching oratory to the scions of Roman nobility. But whether or not he was correct, public speaking has continued to flourish, and has nowhere been so widely and continually practised as in our own United States, at the present day.

The style has changed, of course. Ciceronian, or even Websterian flights of eloquence are rare nowadays. Rhetorical splendor has given way to chatty, conversational informality. After-dinner speeches, inspirational talks to luncheon clubs, sales talks, talks over the radio, to women's clubs, to boy scout rallies, to conventions, to returning heroes, to departing goodwill ambassadors, to devoted stay-at-home audiences; speeches commemorating notable men, donating and accepting city parks and post office buildings, denouncing or supporting the administration, celebrating anniversaries, prophecying disaster or a glowing future, reviewing books, interpreting the news, outlining the ten rules for successful living, describing the newest achievements in science, relating the current Hollywood gossip —so, *ad infinitum,* the list of speech occasions stretches out.

We Are Speech Conscious

The signs of the new speech consciousness are everywhere apparent. The National Association of Teachers of Speech, founded in 1915, now has over 2500 members. And this membership is limited largely to academic teachers. Thousands of speech-hungry men and women flock into the classes of private teachers, of which Dale Carnegie is the symbol and best example. An insurance agent friend of

* In the June, 1939, issue of "Education," Roslyn Collins asks, "Is the Spoken Word Getting a 'Break'?" This article offers an answer.

mine travels 130 miles and pays $10 every week in order to give a two-minute speech and listen to speeches by each of his thirty-nine classmates, under the inspired guidance of a Carnegie school graduate. And he feels that he gets his money's worth. The First Lady of the Land takes voice lessons. Thousands of actors, lecturers, preachers, lawyers, politicians, and their wives, follow her example.

A medium-sized Eastern state university got along with only one teacher of public speaking from its founding until 1928. Now it has ten. An old, conservative publishing house last spring brought out six college textbooks on public speaking — the first time in its long history it had ever done anything like that. Radio delivers speeches into 24,666,500 American homes, and 5,000,000 automobiles. A radio meter installed in New York City indicates that as many people tune in on an important presidential speech as listen to Joe Louis win another championship bout.

Rewards of Speaking Ability

Deliberately testified the late Chauncey Depew, railroad executive and after-dinner speaker *par excellence*, "There is no other accomplishment which any man can have that will so quickly make for him a career and secure recognition as the ability to speak acceptably."

Hundreds of thousands of students, adult and adolescent, take him at his word.

Does your ambition lie in politics? Said William Trotter, international authority in the formation of public opinion, "In ordinary politics it must be admitted that the gift of public speaking is of more decisive value than anything else."

Do you incline to the ministry? Flatly declares Carl S. Patton, of the Pacific School of Religion, "The leaders of the church who have made lasting names for themselves, who have deeply affected the thought of their time and made the church a real power in human life, have never done it by any secondary or accessory means; they have done it by their preaching."

Are you eager for the position of football coach in one of the big universities? Said a sports writer, with his eyes on the national trend, "It is being rumored about the land that many of the colleges are picking coaches with voices that sell well over the airways."

Do you favor an engineering career? All over the country engineering schools are requiring their entrants to commence a course of training in public speaking.

Are you one of the multitude desirous of getting into the movies? Make-up, lights, and skillful direction can compensate for any reasonable flaw of face or figure, but the quality of your voice can't be disguised.

Are you convinced that you will never wish to do anything that demands special skill in speech? Reported a committee of New York school teachers, after a two-year study of the problem, "It must be realized that fully 90 per cent of adult communication is oral."

Demosthenes and Cicero or Coughlin and Ickes

Are you one of those who suspect that skill in public speaking is a sure token of giddy, empty-headed glib-

ness? Do you feel, with Euripedes, the ancient Greek dramatist, that only "they that are among the wise of none account, to mobs are eloquent?" Do you agree with those who point out that when Quintilian described oratory as "the greatest of the gifts of the gods to men," he had Demosthenes and Cicero as examples, while we have Father Coughlin, the late Huey Long, Hugh Johnson, and Harold Ickes? If you do feel suspicious of public speakers, there is another point of view which you ought at least to consider.

Great public speaking is an high art. It is not demagogery. It is not a tool whereby the glib politician works upon the emotions of mobs to catapult himself into public office. It is not the paralyzing palaver of the hypnotic salesman, who lulls his victim into semi-consciousness before getting his name "on the dotted line." It is no more these things than the Sunday newspaper supplement is literature; than the comic cartoons are art; than patent pills are medical science; than the "fifteen-easy-lessons" correspondence courses are education. Every high art has its base competitors, appealing to the coarser emotions and untrained minds of the mob. The symphony orchestra audience knows that around the corner is a swing band. But they remember that there is a difference between music that is art, and music that is excitement.

True oratory is the perfect union of genuine sincerity, deep feeling, intelligent understanding, well-poised action, and impressive style. It is truth being diffused, knowledge being energized, leadership in action.

There are two kinds of useful individuals — those who discover new facts, and those who interpret them and make them useful. Civilization needs both the researcher and the popularizer. Truth discovered but not used is useless. On the other hand, a skillful speaker who does not know and speak the truth is worse than useless; he is guilty of leading his hearers into paths of error. Our researchers need to discover truth; our speakers need to first study and then speak.

As Woodrow Wilson said in his address at his inauguration as president of Princeton University, "We are not put into this world to sit still and know." We must first know, then lead. For speakers of this sort there is today as never before a tremendous demand.

REVIEWS OF RECENT RECORDINGS

WILLIAM P. SEARS, JR.
NEW YORK UNIVERSITY

The Little Organ Book (Volume I). Johann Sebastian Bach. E. Power Biggs, organist. RCA-Victor, Camden, N. J. Victor Musical Masterpieces No. M-652. $6.50.

Among the tremendous amount of music left the world by Johann Sebastian Bach (1685-1750) was a collection entitled *Orgelbuchlein — The Little Organ Book*. In this collection there are works of various kinds appropriate to the seasons of the Church Year. Much of this music, too, is as lovely as anything the great master ever penned. The present album (and there are to be two more to complete the recording) includes selections 17 through 32, covering the Church Year from New Year's Day to the Ascension. E. Power Biggs has made the recordings, playing upon the Baroque organ in Harvard's Germanic Museum. This instrument very closely resembles the instrument that Bach himself used and hence the recordings are of enhanced value. Mr. Biggs brings out the variety of expression which Bach accomplished within the definite formal limits he set for himself. This album is a splendid addition to the list of the recorded works of Bach.

Requiem Mass. Mozart. Choral Society of the University of Pennsylvania and the Philadelphia Orchestra conducted by Hark McDonald. RCA-Victor, Camden, N. J. Victor Musical Masterpieces No. M-649. $12.00.

Here is a splendid recording of what is perhaps one of the greatest choral works of all time. It was in July, 1791, that Mozart was approached by a stranger who commissioned him to write a Requiem Mass for an unrevealed principal. Mozart accepted the strange commission and began at once, despite his illness, the composition of this work. The composer was certain that the stranger was none other than Death himself and, on more occasions than one, Mozart declared that he was in reality writing his own Requiem. On December 4, 1791, though unable to leave his bed, Mozart sang the alto part of the unfinished work at an impromptu rehearsal of the work. In the evening he gave his talented pupil Sussmeyer directions regarding the finishing of the Mass. At one the next morning, Mozart was dead. Sussmeyer completed the work from the fragments left by his master. The present recording by the Choral Society of the University of Pennsylvania and the Philadelphia Orchestra is superb and Mr. McDonald is to be congratulated on his scholarly reading of the work. This is a magnificent recording of one of the greatest works in the literature of music.

Symphony No, 5 in C Minor. Beethoven. Arturo Toscanini and the NBC Symphony Orchestra. RCA-Victor, Camden, N. J. Victor Musical Masterpieces No. 640. $8.00.

It is hardly necessary at this date to extol this mighty *Fifth Symphony* of Ludwig van Beethoven (1770-1827). There is excellent authority for ascribing the beginning of the symphony to the year 1805, when Beethoven was engaged mainly upon the composition of his opera *Fidelio*. This was the period when Vienna was in the hands of the French. The composer was also at work on the *Sixth*, or *Pastoral, Symphony* at the same time. It was not, however, until December 22, 1808, that the two symphonies were first given at a concert in the Theatre *an der Wien* with Beethoven, himself, as conductor. Today, the *Fifth Symphony* stands as one of the imperishable masterpieces of the creative mind. The present recording of this matchless work is exceptionally brilliant. One would expect this for it is Arturo Toscanini leading

the NBC Symphony Orchestra in this dynamic reading of the work. Here is the definitive recording of this mighty, comprehensible, and human music.

"A John Charles Thomas Program." RCA-Victor, Camden, N. J. Victor Musical Masterpieces No. M-645. $8.00.

John Charles Thomas possesses one of the most magnificent baritone voices of this era. This album offers the beautiful voice of Mr. Thomas in eight selections varying all the way from Beethoven to a characteristically Irish tune. The Victor Symphony Orchestra, under Frank Tours, assists Mr. Thomas to good effect. The selections indicate the range of Mr. Thomas' "Program": *In Questa Tomba Oscura*, Beethoven; *O Del Mio Amato Ben*, Donandy; *Lord Randall*, an old English ballad; *Bendemeer's Stream*, Moore-Gatty; *Zaza, Piccolo Zingara* (from Act IV of *Zaza*), Leoncavallo; *Salome! Salome! Demand* (from Act III of *Herodiade*), Massenet; *Di Provenza il Mar* (from Act II of *La Traviata*), Verdi; and *Largo al Factotum* (from Act I of *Barbiere de Siviglia*), Rossini. This is an album of pure song and Mr. Thomas confirms the judgment of those who hail him as one of the greatest of all baritones.

Scheherazade, Op. 35. Rimsky-Korsakov. The Cleveland Orchestra, Artur Rodzinski, conductor. The Columbia Recording Corporation, Bridgeport, Conn. Columbia Masterworks No. M-398. $10.00.

The *Scheherazade* suite of Nicholas Rimsky-Korsakov (1844-1908) is one of the most popular of all orchestral compositions. To some it may be "old-stuff" and to those who delight in the cacophonous discords of the moderns it may seem rather old fashioned. However, for school use this album is a "must" for the library shelf. The magnificent recording by the Cleveland Orchestra under Dr. Rodzinski reveals all the richness of the Oriental splendor intended by the composer. The florid and colorful orchestration has been faithfully reproduced on these discs. Here is a version of *A Thousand and One Nights* that will stand the test of time.

"La Conga" Album. Eight Congas played by Desi Arnaz and his Orchestra. Columbia Recording Corp., Bridgeport, Conn. Columbia Album C-12. $2.50.

The primitive rhythms of the Conga have swept over America this season from Park Avenue to Main Street. The dance itself has been a feature of Cuban life for more than a hundred years, and as such, it is a form of folk dance indigenous to the Latin American countries. Desi Arnaz, who is "tops" as far as this type of music is concerned, plays eight Congas in this album.

Columbia-Brunswick offers two very familiar compositions—the *Orientale* and the *Melodie* of Tschaikovsky (1840-1893)—played by a gifted young Russian violinist who is new to the discs. Vladimir Selinsky plays these rather senuous compositions with vibrant tone and flawless technique (Brunswick 8494).

DEPARTMENT OF BOOK REVIEWS

Education for Democracy. The Proceedings of the Congress of Education for Democracy. Bureau of Publications, Teachers College, Columbia University, N. Y. 1939. $2.50.

"Democracy is always in imbalance, tending to generate into license. And the result of license is always the same thing, sooner or later tyranny. The forces of law and order will not tolerate disorder. But inevitably there is revolt against tyranny. We go around the wheel full circle --democracy, license, tyranny, and then democracy again. We have got to preserve our democracy in balance and see that it does not slip into either license or tyranny." In these words Earl Baldwin of Beudley, former prime minister of England, paraphrased Plato's account of the cycle of human destiny written twenty-five hundred years ago. He, Earl Baldwin, was among the speakers of the Congress on Democracy for Education, held at Teachers College, Columbia University, August 15-17, 1939. England, Poland, Sweden, and the United States were represented on this program by competent men and women, including college presidents, economists, statesmen, preachers, literary authors, historians, business men from farm and industry, and youth workers. These valuable lectures, so representative of current thinking, were published by the Bureau of Publications of Teachers College, and, hence, available to all of us.

This volume represents, I believe, a fair crosscut of some of the best thinking on the problem of education in a democracy. One is sometimes beginning to tire of this new slogan in education, education for democracy. But if any volume merits this title it is this collection of valuable addresses. Among them are some of the keenest analyses of the problems of the democratic way of life, especially with reference to education. President Butler reiterates his well-known definition of education of a generation ago and tells us that he sees no reason to change it today but finds it even more applicable. Dr. Charles A. Beard describes the essentials of democratic thought and life as only a competent historian of his calibre can. John Murray, Lord Eustace Percy, and Earl Baldwin so eminently present the moral bases of a democracy that can survive. President Sloane Coffin and Professor Anton Charles Pegis point to religious foundations of the democratic principle. It is really surprising, and most assuring to some, I am sure, how many of these eminent thinkers find democracy's chief weakness in moral and religious laxity and indecision. How pertinently President Mildred H. McAfee puts her finger on the inadequacies of higher education in our American democracy today. Mr. H. W. Prentis, Jr., strikes a similar note when he points out the menace to American democracy of "foes within the gates."

To me it is disconcerting that so many of American leaders in education, also represented among these lecturers, should still preach a secularized education in face of the fact that very apparently the gravest menace to democratic life is the moral disintegration of our social, economic, and political life. Dr. Beard so appropriately remarks, "Knonwledge is not enough. Science is not enough. Both may be employed to kill as well as to heal. Accumulated facts, though high as mountains, give us no instruction in human values and the choice of application. It is the humane spirit that points the way to the good life." How shall we cultivate the humane spirit? That is *the* question in democratic education today. This volume contains some excellent suggestions. It likewise exposes the superficiality and inadequacy of some current philosophies of life and education which are constantly preaching democracy while their ideology tends to shatter the very

foundations on which our democratic life was founded. Earl Baldwin seems quite right in his analysis as given in the above quotation.

I urge every teacher to read and digest the addresses of this very excellent volume. It is indeed an open sesame of thought and inspiration to thinking. No indoctrination here, no superficial propaganda, but a presentation of dynamic thinking by sincere men and women in positions of leadership in democracy.—C. JAARSMA, State Teachers College, Slippery Rock, Pa.

The Metropolitan Opera — 1883-1939. By *Irving Kolodin.* New York. The Oxford University Press. 1940. $3.75.

The first edition of Mr. Kolodin's authoritative history of the Metropolitan Opera appeared in 1936. The work, a result of careful and painstaking research, was immediately recognized as a standard and authentic history of opera in New York. This new edition of Mr. Kolodin's study brings the story up to date by the addition of much material dealing with the first four years of Edward Johnson's management. To the complete account of opera in New York —the operas, the singers, the conductors, and the impresarios — Mr. Kolodin has added a splendid background in the setting of society and its changes in the years from 1883 to the present. *The Metropolitan Opera* is an essential volume for any library; it is also a most thrilling experience for all those who love music drama. — WILLIAM P. SEARS, JR., New York University.

The Politics of the Balkans. By *Joseph S. Roucek.* The McGraw-Hill Book Company, Inc., New York. 1939. 168 pages. $1.50.

The eyes of the world are turned today on chaotic Europe and, as ever, the Balkan countries are playing their accustomed rôles on the international stage. Dr. Roucek, in this timely little volume, presents the geographic and the historical backgrounds of these interesting and complex states and, at the same time, traces the present-day political developments in Roumania, Yugoslavia, Albania, Greece, Bulgaria, and Macedonia. The author stresses the recent international trends of these post-Munich days and he evaluates the position of the Rome-Berlin axis in the Balkans as well as that of the democracies. The volume is as up-to-date as any book on the subject of international affairs can be in these hectic times. Aside from some rather peculiar inelegancies in the English (the constant use of such vulgarisms as "booted out" is almost inexcusable) the book reads well. Students of international politics will find the work most helpful. The factual material presented is sound and the author has been most zealous in his documentations.—WILLIAM P. SEARS, JR., New York University.

The Secondary School. By *Charles W. Odell.* Garrard Press, Champaign, Ill. 1939. 606 pages. $3.00.

The Secondary School, a text designed for undergraduates preparing to become high school teachers, is no doubt a useful one. It also has considerable reference value for experienced teachers.

A superior feature of this book is its comprehensiveness. In five main divisions, in thirty-five chapters, and in 606 pages, Mr. Odell has provided enlightening discussion on all phases of secondary education. Throughout he has used the historical to help explain the present. In reviewing topics that are characterized by divided opinion he has given a modest and desirable statement of his own views.

Mr. Odell provides long lists of selected references at the ends of chapters. Admitting his great indebtedness to numerous authors and teachers in the field, he however, avoids footnoting each borrowing, thus keeping the reader's comfort in mind.

He writes clearly and in detailed fashion. There is repetition of material in some chapters which may be irksome to an experienced teacher reading through the book, but it is probably desirable to the undergraduate for the sake of emphasis.

The author is associate professor of education at the University of Illinois.

He has been pupil, teacher, and principal in the secondary school, and his writing shows the intimate understanding gained by such experience. He is liberal and progressive in his views on secondary education, but he is not one of those "frontier thinkers" who believe that the schools should make it their business to revise the social structure of this country. In such a matter as organization of the curriculum he does not regard as practical such extreme "cores" as Greek culture, the development of transportation, or the effect of invention on the social structure. —CARL G. MILLER.

Student Teaching. By *C. W. Sanford, W. Habberton,* and *L. J. McHarry.* Stipes Publishing Company, Champaign, Illinois. 164 pp. $1.70.

Prepared as a manual to serve as a guide to supervisory or staff teachers (once upon a time known as critic teachers) and to student teachers, this book describes the various phases of student teaching and provides the student teacher with helpful suggestions and standards of workmanship along the way. The reviewer gets the impression that the authors have used or have had others use this manual with student teachers in manuscript or mimeographed form before the book was published, though this is not indicated in so many words in the preface. Student teachers and staff teachers need a manual of this kind to direct the apprentice teaching activities in most profitable channels. The manual is prepared specifically for secondary teaching.

This handy volume is replete with helpful suggestions for observation, participation, preparation for classroom teaching, and the actual performance in teaching. To help the student to make his observation meaningful and purposeful, suggestive questions are raised which aid the student to look for significant phases of successful teaching. Instructions for the building of units of work and illustrative units are included. Suggestions are given for guiding pupil adjustment and for directed learning. Finally the student-teacher is aided in self-appraisal by including a rating scale and accompanying it with helpful directions for its use. A suggestive bibliography including some of the best books on the art of teaching follows each chapter. The manual is a practical and useful aid to both staff teachers and student teachers in making the student teaching period most effective.

It is suggested that staff teachers evaluate the work of student teachers at the end of the semester. That is hardly sufficient. If an appraisal scale is to be used most effectively, the student should be encouraged to appraise his own work on the bases of the scale at least three times each semester and the staff teacher should check with the student on the latter's appraisal. The appraisal should function as a remedial measure toward improved teaching. It is surprising that at this stage of our knowledge of the learning process the authors should still speak of the student as a "recipient of knowledge." If a student has been a "recipient of knowledge" prior to his student teaching he is not very likely to get much beyond the stage of a *giver of knowledge* as a teacher. This terminology hardly coincides with the emphasis upon stimulating growth and self-activity throughout the manual.

This little volume is a helpful guide to all who direct or are engaged in apprentice teaching.—CORNELIUS JAARSMA, State Teachers College, Slippery Rock, Pennsylvania.

Mental Hygiene. By *William Henry Mikesell.* New York. Prentice-Hall. 1939. 456 pages. $2.50.

This is a practical application of many psychological principles to the problems of everyday living. The emphasis is upon the normal rather than upon the abnormal and the author has attempted to keep his material such that normal people may find it helpful. A good part of the book deals with the explanation and power of suggestion.—WILLIAM P. SEARS, JR., New York University.